

Submitted via the Commission's observation portal

The Secretary,
An Bord Pleanála,
64 Marlborough Street,
Dublin 1.

2 July 2026

Dear Sir/Madam,

Third Party Planning Observation in respect of An Coimisiún Pleanála RED III planning application - Case reference: PAX92.324279 - which pertains to proposed development comprising a 10 year planning permission for the proposed development of Ballincor Wind Farm and all associated infrastructure located within the townlands of located within the townlands of Cloonaheen, Ballincor Demesne, and Curralanty, County Offaly, and Clonfree, Castletown and Cronekill, County Tipperary.

BPS, a firm of Irish Planning Institute accredited town planning consultants¹, is instructed by Greater Birr Wind Action Group [hereafter "client" or GBWAG"], Chair Liam Egan, Ballyegan, Birr, Co. Offaly [hereafter "client" or "group"] to prepare and to lodge a Third Party planning objection to An Coimisiún Pleanála on its behalf in respect of RED III planning application case ref. PAX92.324279², which proposes development at located within the townlands of Cloonaheen, Ballincor Demesne and Curralanty, County Offaly and Clonfree, Castletown and Cronehill, County Tipperary advertised in the statutory notices as follows:

The proposed project is a renewable energy development and will constitute the provision of:

- Assembly of 11 Wind Turbine Generators (including tower sections, nacelle, hub, rotor blades) with an estimated capacity of 61.6 to 77 MW and a blade tip height between 179.5 and 180 m, rotor diameter between 149 to 163 m, hub height of between 98.5 and 105 m;
- Associated hardstanding and turbine foundations at each turbine location;
- Works along the public road and private land for a 12.23 km grid connection to the existing Dallow 110 kV substation including installation of 17 joint bays along the grid connection route ("GCR") which runs across the townlands of Cronekill, Castletown, Cornhill, Caherhoereigh, Pallas, Kylanamuck, Tinnakilly, Ballyloughnane, Killeen, Croghan, in Co. Tipperary and Townparks, Dovegrove, Woodfield or Tullynisk, and Clondallow in Co. Offaly;
- Turbine Delivery Accommodation works, road surfacing works, temporary wall/vegetation removal, load bearing surface will be laid to provide a minimum 4.5 m running width and a 5.5 m clearance width for turbine delivery at Sharavogue crossroads, Sharavogue, Co. Offaly;
- Upgrading of existing access tracks, construction of new founded access roads and floating roads. Total length of access roads is 9.7 km, and upgrades of two site entrances on R492 and L1071;
- Erection of 104 m permanent meteorological mast including lightning pole;
- All associated excavation, earthworks and spoil management, Surface water drainage system and sediment control; Installation of new clear span watercourse or drain crossings on proposed wind farm site
- Excavation and restoration of three borrow pits (borrow pit 1 to borrow pit 3) and one peat deposition area;
- Wheel wash, security fencing & hut;
- Four Temporary construction compounds including site office and staff facilities;
- Installation of 33 kV medium voltage electrical and communication cabling underground between the proposed turbines and the proposed on-site substation and associated ancillary works; All electrical plant and infrastructure and grid ancillary services equipment;
- 110 kV electricity on-site substation and switch rooms; including one EirGrid control building containing welfare facilities and storeroom, wastewater and rainwater holding tank;
- One Independent Power Producer (IPP) control building containing HV switch room, site offices, welfare facilities, wastewater holding tank;
- One Battery energy storage system (BESS) control building containing worker welfare facilities and equipment store, wastewater holding tank; 90 BESS container units, inverters, underground water storage tank and associated works;

¹ www.ipi.ie.

² https://www.pleanala.ie/en-ie/case/324279

- All associated infrastructure and services including site works and temporary construction signage;
- Operational stage site signage;
- All related site works and ancillary development including berms, landscaping, and soil excavation;
- Tree felling (7.2 ha) and hedgerow removal (1.1 km) to facilitate construction and operation of the proposed project; and
- Biodiversity enhancement including hedgerow replanting (1.3 km), peatland enhancement and tree planting.

A 35-year operational life from the date of full commissioning of the wind farm is being sought for all associated works, together with the subsequent decommissioning of those works at the end of that operational period. The proposed onsite substation and grid connection will remain as permanent infrastructure forming part of the Irish national grid network and are not subject to the decommissioning requirement.

This application is accompanied by an Environmental Impact Assessment Report (EIAR) and a Natura Impact Statement (NIS) which pertain to the overall project as outlined above.

GBWAG maintains several significant planning concerns/grounds for observation in respect of this planning application. These are set out in turn in the attached Planning Observation Report.

For the purposes of validation of this observation, please note:

- (1) The fee payable for a 3rd party observation of 50 euro has been paid via the Commission's Third Party observations web portal; and
- (2) A Planning Observation Report is attached setting out our client's 'Grounds for Observation/Objection'.
- (3) This planning application was lodged to ACP on the 8th of May 2026; therefore, the final date for the submission of this objection is the **3rd of July 2026**. This objection is lodged on or before this date.

We confirm that we act as agent for GBWAG. Please direct any correspondence to this office.

If you require any further details, please contact BPS at the address provided.

With best wishes,

Brendan Buck

Brendan Buck MIPI
Managing Director
BPS Planning & Development Consultants LTD

Third Party RED III Planning Observation Checklist

1. Name and address of the Observer: **GREATER BIRR WIND ACTION GROUP, CHAIR LIAM EGAN, BALLEGAN, BIRR, CO. OFFALY..**
2. If an agent is involved, state the name of the Agent: **BRENDAN BUCK MIPI.**
3. Company address of the Agent: **BPS PLANNING CONSULTANTS LTD., PO BOX 13658, DUBLIN 14, D14NY27.**
4. State the Subject Matter of the Objection: **THIRD PARTY PLANNING OBJECTION REPORT IN RESPECT OF AN COIMISIÚN PLEANÁLA RED III PLANNING APPLICATION, CASE REF. PAX92.324279,**
5. Description of the development set out in the statutory notices:

The proposed project is a renewable energy development and will constitute the provision of:

- Assembly of 11 Wind Turbine Generators (including tower sections, nacelle, hub, rotor blades) with an estimated capacity of 61.6 to 77 MW and a blade tip height between 179.5 and 180 m, rotor diameter between 149 to 163 m, hub height of between 98.5 and 105 m;
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A 35-year operational life from the date of full commissioning of the wind farm is being sought for all associated works, together with the subsequent decommissioning of those works at the end of that operational period. The proposed onsite substation and grid connection will remain as permanent infrastructure forming part of the Irish national grid network and are not subject to the decommissioning requirement.

This application is accompanied by an Environmental Impact Assessment Report (EIAR) and a Natura Impact Statement (NIS) which pertain to the overall project as outlined above.

6. Location of development: **ALL LOCATED WITHIN THE TOWNLANDS OF LOCATED WITHIN THE TOWNLANDS OF CLOONAHEEN, BALLINCOR DEMESNE, AND CURRALANTY, COUNTY OFFALY, AND CLONFREE, CASTLETOWN AND CRONEKILL, COUNTY TIPPERARY.**
7. Local authority areas (primary): **OFFALY AND TIPPERARY COUNTY COUNCILS.**
8. Name of assessing authority: **AN COIMISIÚN PLEANÁLA.**
9. Register reference number: **REG. REF. PAX92.324279/**
10. Attach, in full, the Grounds for Objection and the reasons, considerations and arguments on which they are based. **PLEASE FIND A DETAILED PLANNING OBJECTION REPORT ATTACHED.**
11. Enclose/Pay the correct fee for the **Third** Party Objection: **BASED ON THE RENEWABLE ENERGY DIRECTIVE (RED) III INFORMATION GUIDE PUBLISHED IN MARCH 2026, THE FEE FOR MAKING A SUBMISSION OR OBJECTION ON A RENEWABLE ENERGY DEVELOPMENT APPLICATION IS €50.**
12. Ensure that the Objection is received in the **correct manner** and in **time**. **THIS PLANNING APPLICATION WAS LODGED TO ACP ON THE 8TH OF MAY 2026; THEREFORE, THE FINAL DATE FOR THE SUBMISSION OF THIS OBJECTION IS THE 3RD OF JULY 2026. THIS OBJECTION IS LODGED ON OR BEFORE THIS DATE.**



Planning & Development
Consultants

3rd Party Planning Objection

Third Party planning objection Report in respect of An Coimisiún Pleanála RED III planning application, case ref. PAX92.324279, which proposes development comprising of a 10 year planning permission for the proposed development of Ballincor Wind Farm and all associated infrastructure: "The proposed project is a renewable energy development and will constitute the provision of: • Assembly of 11 Wind Turbine Generators (including tower sections, nacelle, hub, rotor blades) with an estimated capacity of 61.6 to 77 MW and a blade tip height between 179.5 and 180 m, rotor diameter between 149 to 163 m, hub height of between 98.5 and 105 m; • Associated hardstanding and turbine foundations at each turbine location; • Works along the public road and private land for a 12.23 km grid connection to the existing Dallow 110 kV substation including installation of 17 joint bays along the grid connection route ("GCR") "[etc.]. all located within the townlands of Cloonaheen, Ballincor Demesne and Curralanty, County Offaly and Clonfree, Castletown and Cronehill, County Tipperary.

This planning objection has been prepared by BPS Planning & Development Consultants Ltd for and on behalf of the Greater Birr Wind Action Group, chair Liam Egan, Ballyegan, Birr, Co. Offaly..

Document Control Sheet

Project	Third Party planning objection in respect of An Coimisiún Pleanála RED III planning application, case ref. PAX92.324279.
Project No.	2026-38g.
Document title	Third party planning objection report.

Contents	No. of pages
Cover page	1
Control sheet	1
Table of contents	4
Text	116
Total No. of Pages	122 (excluding appendices and expert reports)

Rev.	Distribution	Author	Checked	Approved	Day	Month	Year
1	Client	BB	ZB	FB	12	6	2026
2	Client	BB	ZB	FB	30	6	2026
3	An Coimisiún Pleanála	BB	ZB	FB	2	7	2026

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Date: 2 July 2026

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Copies of original expert reports

1.0 Introduction

BPS, a firm of Irish Planning Institute accredited town planning consultants¹, is instructed by Greater Birr Wind Action Group, chair Liam Egan, Ballyegan, Birr, Co. Offaly.. Hereafter "client" or "group"] to prepare and to lodge a Third Party planning objection to An Coimisiún Pleanála on its behalf in respect of RED III planning application case ref. PAX92.324279², which proposes development at located within the townlands of Cloonaheen, Ballincor Demesne and Curralanty, County Offaly and Clonfree, Castletown and Cronehill, County Tipperary advertised in the statutory notices as follows:

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This application is accompanied by an Environmental Impact Assessment Report (EIAR) and a Natura Impact Statement (NIS) which pertain to the overall project as outlined above.

Our client comprises of a group of local people who maintain significant concerns over these proposals. They wish to object against this proposed development for the reasons set out in Section 7.0 of this Planning Objection Report.

This planning objection has been prepared by BPS Planning & Development Consultants LTD.

This planning application was lodged to ACP on the 8th of May 2026; therefore, the final date for the submission of this objection is the **3rd of July 2026**. This objection is lodged on or before this date.

For the avoidance of doubt, our client notes that this entire report and the attached covering letter and form comprises their full objection. Conclusion and recommendation sections are provided in Sections 8.0 and 9.0 of this Planning Objection Report.

¹ www.ipi.ie.

² <https://www.pleanala.ie/en-ie/case/324279>

1.1 The expert team representing Greater Birr Wind Action Group

This planning objection is informed by and supported by appendices prepared by experts or with the advice of experts:

Appendix 1: Noise – Allegro Acoustics.
 Appendix 2: Shadow Flicker.
 Appendix 3: Biodiversity.
 Appendix 4: Hydrology - Prof. Pamela Bartley, Hydrologist – Hydrology.
 Appendix 5: Landscape and Visual Impact.
 Appendix 6: Roads, Transport and Traffic.
 Appendix 7: Site Selection.
 Appendix 8: Ornithology – Dr. Pat Moran, Ecologist – Ornithology.
 Appendix 9: The Barn Owl – Susan Kerwin.
 Appendix 10: Equine.
 Appendix 11: Impact on Material Assets.
 Appendix 12: Aerodrome.
 Appendix 13: Waste Management.

The expert reports are attached after Appendix 13.

2.0 Rationale and Summary of this Objection

Our client's group objects to the proposed Ballincor Wind Farm on the basis that the development is not supported by a proper plan-led approach and has not been demonstrated to be appropriate having regard to the sensitivity of the receiving environment. While the GBWAG acknowledges the importance of renewable energy generation and the need to support the transition to a low-carbon energy system, such policy support does not override the requirement for development to be appropriately sited, environmentally robust, and consistent with the proper planning and sustainable development of the area.

A central concern is that the proposed development is located within lands expressly identified as unsuitable for wind energy development under the relevant local planning framework. The proposal therefore conflicts with the spatial strategy established by the Offaly County Development Plan and the Tipperary County Development Plan, both of which seek to direct wind energy development away from more environmentally, visually and residentially sensitive locations. The application has not adequately justified why a large-scale wind energy development should be permitted in an area where the adopted plan-led framework has already determined that wind energy development is not appropriate.

This is not a modest or discreet renewable energy proposal. The development comprises eleven wind turbines of up to 180 metres tip height, turbine foundations, crane hardstandings, internal access tracks, borrow pits, temporary construction compounds, a 110kV on-site substation, Battery Energy Storage System infrastructure, underground cabling, a grid connection route of approximately 12.23km to Dallow 110kV substation, turbine delivery route works, felling, hedgerow removal, drainage infrastructure and associated ancillary works. The proposal would introduce major industrial-scale energy infrastructure into a rural landscape containing dispersed residential properties, sensitive ecological receptors, peatland and wetland habitats, watercourses, and the wider landscape setting of Birr and surrounding settlements.

The GBWAG is particularly concerned that the application seeks a ten-year permission, a 35-year operational life for the wind farm, and permanent permission for the grid connection and substation infrastructure. In practical terms, this represents a long-term and partly permanent transformation of the receiving environment. The application has not adequately justified why the normal five-year permission period is insufficient, nor has it demonstrated that the environmental baseline relied upon in the EIAR would remain sufficiently current over such an extended period.

The GBWAG's concerns are not abstract. The receiving environment is demonstrably sensitive. The site and surrounding area contain raised and cutover bog, wet grassland, woodland, hedgerows, treelines, drainage ditches, the Little Brosna River corridor, protected species interests and hydrological connections to sensitive downstream receptors. The application itself identifies multiple ecological constraints, including habitats of elevated ecological value, bat activity, protected mammal activity, invasive species, Marsh Fritillary habitat, amphibian interests and aquatic sensitivities. Separately, the ornithological context includes wintering bird interests, including whooper swan and calow-related sensitivities. These matters reinforce the GBWAG's position that the site is not inherently suitable for development of the scale proposed.

The proposal also gives rise to significant concerns in relation to residential amenity. The noise assessment, shadow flicker assessment, visual impact assessment and cumulative assessment each raise questions as to whether nearby residents would be adequately protected. In particular, concerns arise regarding noise modelling assumptions, cumulative wind farm noise, limited compliance margins, reliance on extrapolated background data, extensive pre-mitigation shadow flicker exceedances, reliance on turbine shutdown systems, and the long-term visual transformation of the rural residential environment.

A further concern is the degree to which the application relies upon mitigation measures, future surveys, post-consent management plans, operational controls, adaptive management and monitoring. The GBWAG does not dispute that mitigation and monitoring may form part of a lawful assessment. However, where a decision-maker is required to be

satisfied that significant adverse effects can be avoided or reduced to acceptable levels, the necessary information must be sufficiently clear, certain and enforceable at application stage. In this case, the level of reliance on future refinement gives rise to uncertainty across a number of environmental disciplines, including ecology, ornithology, hydrology, peat stability, noise, shadow flicker, BESS safety and residential amenity.

The GBWAG is also concerned that the application does not adequately address the cumulative and combined effects of the proposed development with other wind energy developments, grid infrastructure, BESS infrastructure and associated works within the wider receiving environment. The cumulative assessment appears to be largely compartmentalised by topic chapter and does not sufficiently assess the overall combined environmental burden on local residents, ecological receptors, landscape character and rural amenity.

The GBWAG further raises procedural and assessment adequacy concerns, including the repeated lodgement history of the application, design flexibility and absence of a final turbine specification, fragmentation of certain turbine delivery route works, inconsistencies in receptor identification, uncertainty regarding ecological survey timing, and the need for robust decommissioning security. These matters are relevant to the Commission's assessment of whether the application documentation is sufficiently complete, transparent and reliable.

Summary objection points

- **Siting is unacceptable and not supported by any Development Plan** - The development is located in areas explicitly designated as unsuitable for wind energy under both the Offaly and Tipperary County Development Plans / Wind Energy Strategies.
- **Material Contravention of Development Plans –**
 - Direct conflict with Offaly Wind Energy Strategy and Tipperary Renewable Energy Strategy (lands designated "Not Deemed Suitable" / "Unsuitable for New Wind Energy Development").
 - Undermines the plan-led approach to wind energy.
- **Inappropriate Siting & Landscape Impact -**
 - Site in a sensitive rural landscape with peatlands, wetlands, callows, dispersed housing, and high amenity areas.
 - Significant adverse landscape and visual effects; would industrialise the rural character near Birr.
- **Noise & Shadow Flicker -**
 - Deficiencies in noise modelling (underestimation, valley propagation, high wind speeds, cumulative effects).
 - Extensive pre-mitigation shadow flicker exceedances; over-reliance on turbine shutdown systems.
- **Biodiversity, Ornithology & Ecology –**
 - Inadequate baseline surveys, collision risk assessment, and cumulative effects on birds (including SPA species).
 - Concerns regarding Marsh Fritillary, bats, protected species, and habitat loss.
 - Weak operational monitoring and adaptive management (lacks enforceable triggers).
- **Hydrology, Peat & Soils**
 - Significant peat disturbance, stability risks, and potential water quality impacts.
 - Insufficient assessment and over-reliance on future mitigation.
- **Traffic, Access & Grid Connection –**
 - Unsuitable roads for abnormal loads, construction traffic, and grid works.
 - Fragmentation of turbine delivery route works.
- **BESS & Fire Safety –**
 - Insufficient certainty on lithium-ion battery fire risks, toxic gases, emergency response, and public safety.
 - Over-reliance on future plans and fire service consultation.
- **Procedural & Assessment Deficiencies –**
 - Repeated application lodgements/withdrawals.
 - Design flexibility (no final turbine model).
 - Inadequate alternatives assessment and receptor identification.
 - Excessive reliance on post-consent mitigation and monitoring.

• Other Concerns –

- Ten-year permission not justified; 35-year operation plus permanent grid infrastructure.
- Inadequate decommissioning security.
- Cumulative and combined effects not properly assessed.
- Potential breach of Article 8 ECHR (residential amenity and private life).

For these reasons, and for the detailed grounds set out in the following sections of this report, the GBWAG submits that the proposed development would be contrary to the proper planning and sustainable development of the area. The Commission is respectfully requested to refuse permission.

1.2 Material contravention & *Coolglass Wind Farm Limited v An Bord Pleanála* [2025] IEHC 1,

In our client's opinion, An Coimisiún Pleanála is being asked to materially contravene the adopted Development Plan framework and to do so knowing that this will adversely impact the local landscape, local properties, residential amenity, ecology, ornithology, surface water, peatland, local roads, and the proper planning and sustainable development of the area.

The applicant is correct that wind energy is supported in principle at national, regional and local policy level. However, such support is not unconditional. Wind energy proposals must still address standard planning policies as set out in the relevant Development Plans, including the Offaly County Development Plan 2021–2027, the Offaly Wind Energy Strategy, the Tipperary County Development Plan 2022–2028 and the relevant Tipperary renewable energy policy framework. These statutory plans retain primacy in regulating local development and in identifying where wind energy development may, and may not, be appropriately accommodated. Our client's group does not accept that renewable energy projects should receive special treatment as regards discarding substantive and material planning concerns.

More than this, the applicant appears to proceed on the basis that national renewable energy policy, RED III and climate targets are capable of overriding any local planning conflict. This planning objection demonstrates that such an approach is misconceived. Not every renewable energy project can be an acceptable one. Not every wind farm can claim to be the critical project required to allow Ireland to meet every renewable energy and climate target. Ireland also has responsibilities in respect of landscape protection, biodiversity, water quality, peatlands, cultural heritage, residential amenity, public health and the integrity of the plan-led planning system. The Commission's responsibility is to ensure a balance between competing priorities. The applicant's project fails to achieve this balance.

BPS is fully aware of the High Court judgment in *Coolglass Wind Farm Limited v An Bord Pleanála* [2025] IEHC 1, delivered on 10 January 2025 by Mr Justice Richard Humphreys. The case involved a judicial review of An Bord Pleanála's refusal of planning permission for a 13-turbine wind farm in County Laois, based on material contravention of the Laois County Development Plan, which identified the area as not open for consideration for wind energy development due to visual and landscape impacts. Coolglass argued that the refusal breached section 15(1) of the Climate Action and Low Carbon Development Act 2015, as amended, which requires public bodies to perform their functions in a manner consistent with national climate objectives and policies, insofar as practicable. Humphreys J. quashed the Commission's decision and remitted it for reconsideration, holding that the Commission had unlawfully fettered its discretion by adopting an overly rigid approach to local development plan restrictions on renewable energy development.

That High Court judgment was subsequently considered by the Supreme Court. The Commission, with the support of the State, sought and was granted leave to appeal directly to the Supreme Court due to the systemic importance of the case and its potentially far-reaching consequences for planning decisions and climate obligations under the Climate Action and Low Carbon Development Act 2015, as amended.

The relevant timeline is now as follows:

- **January 2025:** The High Court quashed the Commission's refusal of planning permission and remitted the matter for reconsideration, finding that the Commission had failed to properly engage with its obligations under section 15 of the Climate Action and Low Carbon Development Act 2015.
- **May 2025:** A three-judge Supreme Court panel granted leave for a leapfrog appeal, recognising that the case raised issues of systemic importance concerning the scope of section 15 duties, the role of development plans, and the balancing of climate obligations against local planning considerations.
- **February 2026:** The Supreme Court delivered judgment in *Coolglass Wind Farm Limited v An Coimisiún Pleanála* [2026] IESC 5. The Supreme Court dismissed the appeal against the High Court order, but importantly clarified the correct legal approach. The judgment confirms that climate obligations are real and must be meaningfully considered by the Commission. However, it does not establish an automatic presumption that renewable energy projects must be permitted notwithstanding conflict with the Development Plan. The decision still requires the Commission to exercise planning judgment, to balance competing considerations, and to assess whether the particular development before it is acceptable having regard to proper planning and sustainable development.

As it stands, the Commission is asked to uphold local planning concerns where these are significant, evidence-based and grounded in the statutory Development Plan framework. Technical concerns pertaining to landscape and visual impact,

ecology, ornithology, surface water, peat stability, noise, shadow flicker, residential amenity, turbine delivery, traffic and roads, development duration, BESS safety, cumulative impacts and the need to protect existing rural communities are all significant concerns in this case. These are not peripheral or minor matters. They are concerns which, when assessed in detail, demonstrate clear conflict with the adopted Development Plan framework.

We note, in particular, the following weaknesses of the applicant's case:

- **Inadequate assessment of cumulative impact:** the applicant has failed to properly assess the combined impact of the proposed development with existing, permitted and proposed wind energy, grid, BESS and associated infrastructure in the wider receiving environment.
- **The proposal is misaligned with the Development Plan:** while national policy supports renewable energy, the Offaly and Tipperary Development Plans contain specific wind energy strategies, landscape protections, environmental safeguards and spatial designations identifying where wind energy development is, and is not, appropriate. There is a direct conflict between the applicant's proposal and these adopted statutory plans.
- **The proposal is at odds with the Commission undertaking its statutory duties:** the Commission's duties require it to assess impacts on landscape, ecology, Natura 2000 sites, water quality, peatlands, local roads, residential amenity, human health, noise, shadow flicker, visual amenity and the proper planning and sustainable development of the area. RED III and national climate policy do not remove those duties.

In this case, the planning authority has already undertaken the relevant plan-led exercise through the adopted Wind Energy Strategy designations. The subject lands have been identified as not suitable for wind energy development. The current proposal is, in short, an attempt to override that plan-led conclusion through reliance on national policy, without adequately addressing the site-specific reasons why the lands were deemed unsuitable in the first instance.

These concerns, in our client's opinion, comfortably exceed the threshold at which the Commission may and should refuse permission notwithstanding the acknowledged climate and renewable energy benefits of the proposal. Coolglass requires meaningful engagement with climate obligations; it does not require the Commission to disregard Development Plan conflict, environmental constraints, residential amenity impacts or proper planning concerns.

3.0 Location and Description of the Subject Site – Site Should Have Been Screened out at Scoping

The subject site is located on lands at Ballincor, on the border of Counties Offaly and Tipperary, approximately 5 km south of Birr and 3.6 km north of Shinrone. The site lies within a rural landscape characterised by a mix of agricultural lands, commercial forestry and areas of cutover peatland, with access provided via the regional road network (R492) and a series of local roads.

The context of the area surrounding the subject site is illustrated below in Fig. 1.

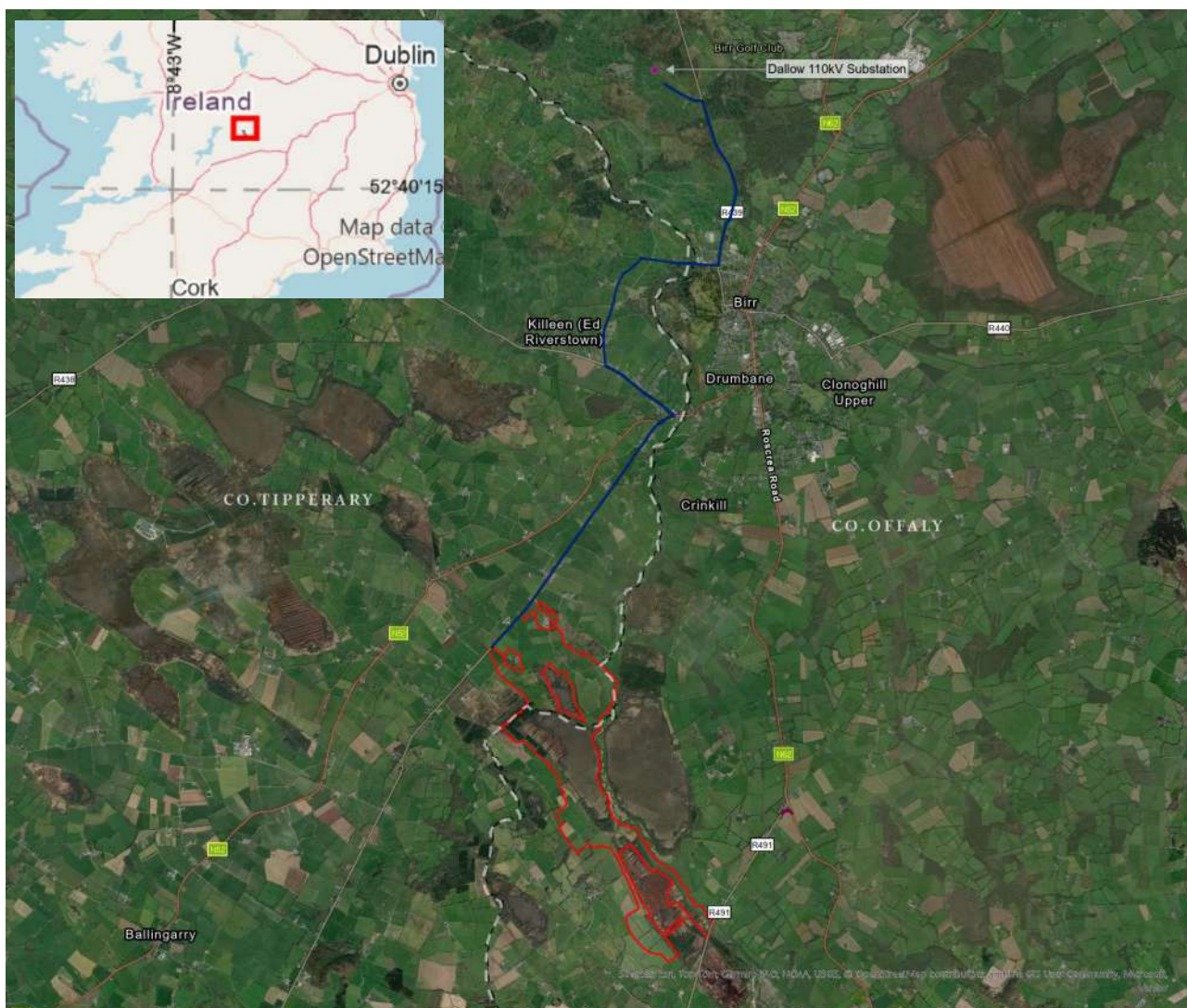


Fig. 1: Site Context Map with Subject Site Indicatively Labelled (Source: Applicant's Planning Statement, annotated)

The proposed development site comprises a large, dispersed landholding extending across agricultural fields, forestry plantations and peatland areas. The lands are typical of the wider rural landscape in this part of Offaly and North Tipperary, with a network of local roads, hedgerows and field boundaries defining the landscape structure.

The site is located within a predominantly rural receiving environment, albeit with proximity to key infrastructure. The N52 national road lies approximately 1 km to the north, while the N62 is located approximately 3 km to the west. The Little Brosna River forms part of the eastern boundary of the site.

The proposed development includes extensive internal infrastructure, including approximately 9.7 km of internal access tracks, as well as a grid connection route extending approximately 12.23 km to the Dallow 110kV substation. Turbine delivery is proposed via a long-distance route from Foynes Port through the national road network.

Residential receptors are located in proximity to the site. The applicant indicates a general setback of approximately 720 metres from dwellings, with at least one dwelling located at a reduced setback of approximately 550 metres. The surrounding area is characterised by dispersed rural housing typical of the Midlands region.

The site is located within an area designated under both the Offaly County Development Plan 2021–2029 and the Tipperary County Development Plan 2022–2028 as unsuitable for wind energy development. Notwithstanding this designation, the applicant seeks permission on the basis of national climate policy considerations.

The wider landscape is identified as a working rural landscape comprising agricultural land uses, settlement patterns and infrastructure. The area retains a strong rural character, with landscape sensitivity arising from its openness, peatland features and hydrological connections.

An annotated satellite image of the subject site is provided below in Fig. 2.



Fig. 2: Map showing Applicant's Overall Landholding (Indicative Only) (Source: Applicant's Planning Statement, annotated)

3.1 Identified Constraints of the Subject Site

Notwithstanding the strategic policy context advanced by the applicant, the subject site exhibits a number of inherent constraints arising from its rural setting, environmental characteristics and the existing pattern of development in the surrounding area.

The site is located within a predominantly rural landscape comprising agricultural lands, forestry and areas of cutover peatland. This landscape is characterised by a dispersed settlement pattern, with residential properties located throughout the wider area in proximity to the proposed development site. The presence of these receptors gives rise to potential conflicts in terms of residential amenity, having regard to the scale, height and operational characteristics of the proposed wind energy development.

The receiving environment is further defined by its open and exposed nature, with limited existing vertical structures of comparable scale. The proposed development, comprising turbines with a blade tip height of up to approximately 180 metres, would introduce a significant and visually dominant form of development into this landscape, representing a marked departure from the established rural character of the area.

While the site is located in relative proximity to elements of strategic infrastructure, including the N52 and N62 national road network and electrical infrastructure, such development is generally linear or spatially contained. In contrast, the proposed development would introduce a dispersed yet extensive pattern of large-scale infrastructure across a greenfield site, including turbines, internal access tracks, grid connection infrastructure and ancillary development, resulting in a substantial intensification of development across the landscape.

The environmental characteristics of the site also give rise to constraints. In particular, the presence of peatland areas and the proximity of the Little Brosna River along the eastern boundary of the site highlight the sensitivity of the receiving environment in terms of hydrology and potential ecological impacts.

In addition, the site is located within areas identified under both the Offaly and Tipperary County Development Plans as unsuitable for wind energy development. This designation reflects an acknowledged sensitivity of the landscape and environment, and further reinforces the inherent constraints associated with the site.

The combination of dispersed residential receptors, landscape sensitivity, environmental considerations and policy constraints indicates that the site has a limited capacity to accommodate development of the scale and nature proposed without giving rise to adverse impacts. These constraints are material to the assessment of the proposed development and are considered in detail in the sections that follow.

3.2 Site Should Have Been Screened out at Scoping Stage

Having reviewed the site's location, it is the professional opinion of BPS that the site should have been screened out by the applicant at scoping stage and for the following reasons:

- **Direct Conflict with Adopted Development Plan Policy** - The site is explicitly designated as "Areas Not Deemed Suitable for Wind Energy Development" in both the Offaly County Development Plan 2021–2027 (Wind Energy Strategy, Map 10) and the Tipperary County Development Plan 2022–2028 / Renewable Energy Strategy. These designations were made through a detailed, SEA- and AA-informed constraint-led planning process. The plans deliberately directed wind energy to more suitable locations. Granting permission here would represent a material contravention of the statutory Development Plans.
- **High Landscape and Visual Sensitivity** - The area has a strong rural character with open, low-lying agricultural land, peatlands, and limited existing vertical features. Turbines up to 180m tip height would be highly dominant and industrialising in this context. Proximity to the landscape setting of Birr, scenic routes, Areas of High Amenity, and the Little Brosna Callows landscape. Cumulative visual impact with other existing and permitted wind farms (e.g., Lacka, Carrig) would intensify the industrial character of the area.
- **Dispersed Residential Settlement Pattern** - Numerous homes are located relatively close to the proposed turbines (some as near as c. 550m). This creates significant potential for long-term impacts on residential amenity (noise, shadow flicker, visual dominance, construction disturbance).
- **Environmental and Ecological Constraints** –
 - Peat and soft ground — significant peat excavation and stability risks.
 - Hydrological sensitivity — proximity to the Little Brosna River, drainage channels, wetlands, and callows with downstream connections to protected European sites.
 - Ornithological sensitivity — used by wintering birds, including SPA qualifying species (Whooper Swan, Golden Plover, Black-tailed Godwit, etc.).
 - Presence of protected species habitats (Marsh Fritillary, bats, otters, etc.).
 - The site was deliberately excluded from suitable areas due to these environmental sensitivities.
- **Poor Site Selection Rationale** - The applicant has not adequately explained why they chose a site that was strategically assessed and rejected as unsuitable by two county councils. Alternatives assessment is considered weak — it does not robustly demonstrate why more policy-compliant locations were not selected.
- **Cumulative Impact Concerns** - The wider area already has several operational and permitted wind farms. Adding 11 large turbines, BESS, substation, and a long grid connection would result in over-concentration of energy infrastructure in a relatively sensitive rural area.
- **Overall Planning Balance** - While national policy strongly supports renewable energy, the local Development Plans require a reasonable balance with landscape protection, biodiversity, residential amenity, and proper planning. This site location fails that balance due to its inherent constraints.

The core argument put forward by the applicant is that this site was identified as suitable for a wind farm at scoping stage when different alternatives were being considered. This scoping process has failed as this site is wholly unsuitable. The site was deliberately identified as unsuitable through a proper plan-led process because of its landscape sensitivity, ecological value, proximity to dwellings, and peat/hydrological constraints. The proposal attempts to override that strategic planning decision with national climate policy, which is not acceptable without much stronger justification.

4.0 Planning & Enforcement History

This section aims to provide an overview of the sites planning and enforcement history pertaining to the subject site. A comprehensive review of both the National Planning Application Database, both Offaly and Tipperary County Council's online planning application viewer and An Coimisiún Pleanála's case search tool has been conducted in this regard.

4.1 Subject Site

The planning history of the subject site is notably recent and relates entirely to multiple applications submitted by the applicant, RWE Renewables Ireland Limited, within a short timeframe in April 2026.

The sequence of submissions, including a withdrawal and a subsequent invalid application prior to the lodgement of the current application, is of particular relevance in understanding the procedural context of the proposed development.

4.1.1 Withdrawn Application – ACP Ref. 324220

An application was submitted by RWE Renewables Ireland Limited on 17th April 2026 to An Coimisiún Pleanála under Strategic Infrastructure Development provisions (ACP Ref. 324220), seeking a 10-year permission for the construction of the proposed Ballincor Wind Farm and associated infrastructure.

This application was subsequently withdrawn by the applicant on 20th April 2026, within three days of lodgement.

No formal reason for the withdrawal has been published on the public record. The timing of the withdrawal suggests that the application may have been incomplete, deficient, or otherwise not in a position to proceed to validation.

4.1.2 Invalid Application – ACP Ref. 324246

Following the withdrawal of the initial application, the applicant submitted a further application on 24th April 2026 under ACP Ref. 324246, again seeking permission for the proposed Ballincor Wind Farm development under the Strategic Infrastructure Development process, including reference to RED III provisions.

This application was subsequently deemed invalid by An Coimisiún Pleanála. Notably, no application documentation was made available on the public planning portal, and the specific reasons for invalidation have not been published.

The invalidation of this second application, particularly in the context of the immediately preceding withdrawal, raises concerns regarding the completeness and procedural robustness of the applicant's submissions at that time.

4.1.3 Subject Application – ACP Ref. 324279

Following the withdrawal of ACP Ref. 324220 and the invalidation of ACP Ref. 324246, RWE Renewables Ireland Limited subsequently lodged the current application under ACP Ref. 324279, which was accepted as valid by An Coimisiún Pleanála.

The current application relates to the proposed Ballincor Wind Farm and associated infrastructure, located across lands within County Offaly and County Tipperary in the wider Ballincor, Sharavogue, Carrig, Riverstown and Birr receiving environment. The application is made under the Strategic Infrastructure Development process and is presented by the applicant in the context of national renewable energy policy, climate action objectives and RED III provisions.

In summary, the proposed development comprises a substantial wind energy development consisting of eleven wind turbines with a maximum blade tip height of up to 180 metres, together with turbine foundations, crane hardstandings, internal access tracks, borrow pits, temporary construction compounds, underground cabling, drainage infrastructure, meteorological mast, a 110kV on-site substation, Battery Energy Storage System infrastructure, and all associated site development works.

The proposed development also includes a grid connection route of approximately 12.23 kilometres to the existing Dallow 110kV substation, including underground electrical cabling, joint bays and associated works. The application further includes turbine delivery route accommodation works, including works to facilitate abnormal load movements, together with felling, hedgerow removal, road-interface works and ancillary infrastructure required to facilitate the construction and operation of the proposed wind farm.

The application seeks a ten-year permission for the proposed development, with a proposed operational life of 35 years from full commissioning. The on-site substation and grid connection infrastructure are proposed to remain as permanent infrastructure forming part of the national electricity grid and would not be subject to the same decommissioning requirement as the wind farm infrastructure.

The application is supported by a substantial suite of planning and environmental documentation, including a Planning Statement, Environmental Impact Assessment Report, Natura Impact Statement, Appropriate Assessment Screening Report, Construction Environmental Management Plan, Surface Water Management Plan, Flood Risk Assessment, Peat Stability and Spoil Management documentation, noise and shadow flicker assessments, landscape and visual impact assessment, photomontages, ecological and ornithological assessments and various technical appendices.

The acceptance of the current application as valid does not remove the relevance of the earlier withdrawal and invalidation. Rather, the sequence of lodgements forms part of the procedural context in which the current application

should be assessed. In circumstances where the proposed development is complex, multi-component, cross-county in nature and reliant upon extensive technical documentation, the earlier procedural history reinforces the need for careful scrutiny of the completeness, clarity, consistency and adequacy of the current application documentation.

The substantive concerns arising from the subject application, including site suitability, Development Plan conflict, hydrology, peat stability, ecology, ornithology, landscape and visual impact, noise, shadow flicker, BESS safety, cumulative impact, alternatives, residential amenity and procedural adequacy, are addressed in detail in the grounds of objection set out below.

4.2 Notable Wind Farm Planning Applications in Tipperary & Offaly

A review of notable recent wind energy developments within Counties Offaly and Tipperary has been undertaken in order to provide planning context for the assessment of the subject application and to examine how similar proposals have been considered by both the planning authorities and An Coimisiún Pleanála.

4.2.1 Carrig Renewables Wind Farm – TCC Ref. 23/60763 / ACP Ref. PL92.318689

A notable recent wind energy application in the wider receiving environment is the Carrig Renewables Wind Farm, submitted under Tipperary County Council Ref. 23/60763 and subsequently considered by An Coimisiún Pleanála under ACP Ref. PL92.318689.

The application related to a substantial wind energy development comprising seven wind turbines with a total tip height range of 179.5m–185m, together with associated hardstand areas, a permanent 38kV electrical substation, BESS infrastructure, underground grid connection cabling to the existing Dallow 110kV substation in County Offaly, joint bays, internal cabling, a meteorological mast, access tracks, new entrances, peat and spoil repository areas, construction compounds, turbine delivery accommodation works, drainage, tree felling and associated site development works. The proposed development also included works within the curtilage of Protected Structures RPS Ref. TRPS336, Ballyloughnane Bridge, and RPS Ref. TRPS519, Croghan Bridge.

Tipperary County Council refused permission for the proposed development on 16th November 2023 for three reasons. The first refusal reason related to the location of the site within an area identified as unsuitable for new wind energy development. The Council stated:

Notwithstanding the general Planning Policy support for wind energy generation at national, regional and local policy level... the proposed development is located on lands identified as an area unsuitable for new wind energy development within the Tipperary Renewable Energy Strategy. Furthermore, it is considered that the proposed development would not, come within the limited circumstances provided for in policy TWIND 4.14. of the Wind Energy Strategy in the Renewable Energy Strategy.

The Council therefore concluded that:

the proposed development would contravene materially the policies and objectives of the Tipperary County Development Plan 2022 - 2028, specifically Volume 3, Appendix 2, Tipperary Renewable Energy Strategy, Wind Energy Strategy, Policy TWIND 4. The proposed development would, therefore, be contrary to the proper planning and sustainable development of the area.

The second refusal reason related to ecological and ornithological concerns, including potential effects on European sites and Annex I bird species. The Council stated that, having regard to the EIAR, NIS and submissions received:

the Planning Authority is not satisfied that the likelihood of significant effects on the environment can be excluded. The applicant has failed to demonstrate that the development on the site would not have an adverse impact on the site integrity of the local sites within the Natura 2000 network.

The Council further considered that the proposed development would: "result in a loss of habitat, disturbance and displacement for Annex I bird species" and would be contrary to the proper planning and sustainable development of the area.

The third refusal reason related to traffic and road capacity. The Council concluded that the applicant had: "failed to demonstrate that the proposed development would not have a significant detrimental impact on the capacity and operation of such road network".

On this basis, the Council considered that the proposal would materially contravene Policy 12-4 of the Tipperary County Development Plan 2022–2028 and would be contrary to the proper planning and sustainable development of the area.

The Council Planner's Report is also notable in the context of the subject application. The report recorded concerns raised by the Department of Housing, Local Government and Heritage, including that insufficient information had been provided to fully assess impacts on Natura 2000 sites, Annex species and biodiversity generally. The Department raised specific concerns regarding ornithology, hydrology, wetland sites, whooper swan roosting and commuting activity, displacement, collision risk, nocturnal bird movements, peatland drainage and the potential for adverse effects on European sites. The

Department concluded that it was not able to conclude that the proposed development, individually or in combination with other plans or projects, would not adversely affect the integrity of any European site.

The Planner's Report further noted concerns raised by Transport Infrastructure Ireland, which considered that the proposed development was at variance with official policy in relation to development affecting national roads and that insufficient information had been provided in relation to the turbine component haul route, national road structures and grid connection works along the national road network.

The Carrig Renewables case is therefore relevant because Tipperary County Council refused a large-scale wind energy proposal in the wider area on grounds which closely overlap with the issues arising in the subject application, namely conflict with wind energy suitability designations, ornithological and Natura 2000 concerns, and road capacity / road safety concerns.

It is acknowledged that An Coimisiún Pleanála subsequently overturned the refusal and granted permission. In doing so, the Inspector accepted that the proposal materially contravened the Tipperary County Development Plan by reason of its location within lands identified as unsuitable for new wind energy development. However, the Inspector considered that the Commission could rely on section 37(2)(b)(i) and (iii) of the Planning and Development Act 2000, as amended, having regard to the strategic and national importance of wind energy development, national climate policy, renewable energy targets, and relevant national and regional policy support.

In relation to ornithology, the Inspectorate Ecologist concluded that adverse effects on the integrity of relevant SPA sites could be excluded on the basis of the information submitted, including the first-party appeal response and additional survey material. However, the Inspectorate Ecologist also noted that the introduction of the wind farm would result in local-level impacts which may have been underestimated, particularly for the local whooper swan population and in terms of the current and future ornithological ecological value of the site.

In relation to roads, the Inspector noted that Tipperary County Council's Roads Section had no objection subject to conditions, and that the applicant had submitted additional information at appeal stage, including an independent Stage 1 Road Safety Audit. The Inspector considered that the traffic and road-related concerns could be addressed by condition.

Accordingly, while Carrig Renewables was ultimately granted permission on appeal, it remains a highly relevant planning history case. It demonstrates that Tipperary County Council has recently refused comparable wind energy development in this wider receiving environment on grounds of Development Plan conflict, ornithological / Natura 2000 uncertainty and road impact. It also demonstrates that where the Commission departs from a local authority refusal in such circumstances, it does so only after detailed consideration of material contravention, additional appeal-stage information, ecological evidence, road safety evidence and proposed mitigation.

4.2.2 Rin, Ferbane Wind Turbine – OCC Ref. 21/306 / ACP Ref. PL19.311043

A further notable wind energy application within County Offaly relates to a proposed wind turbine development at Rin, Ferbane, County Offaly, submitted under Offaly County Council Ref. 21/306 and subsequently considered by An Coimisiún Pleanála under ACP Ref. PL19.311043.

The application related to the construction of a single 4.2MW wind turbine with an overall tip height of up to 150 metres, together with associated foundations, hardstanding and assembly area, site entrance, access track, on-site 20kV substation, underground electrical cabling and all associated ancillary development works. The proposed turbine was located approximately 1km north-west of Lough Boora Discovery Park and in proximity to the existing two-turbine Leabeg Wind Farm.

Offaly County Council refused permission for the proposed development on 9th July 2021. The sole reason for refusal was the site's location outside lands identified for wind energy development within the Offaly County Development Plan Wind Energy Strategy. The Council stated:

The subject site is not located in an area identified for wind energy development in the Development Plan. Therefore, it is considered that the proposed development would materially contravene Policy EP-05 and Objective EO-01 of the Offaly County Development Plan 2014-2020 and, as such, would be contrary to the proper planning and sustainable development of the area.

The Planning Report prepared by Offaly County Council provides further detail regarding the concerns underpinning this refusal. The Planner concluded that the site was not located within a Wind Energy Strategy Area identified in the Development Plan and that none of the limited exceptions contained within the Wind Energy Strategy applied to the proposal. The report further noted that the proposed development was located immediately adjacent to lands designated as Areas of High Amenity and High Landscape Sensitivity and stated that the applicant had failed to adequately demonstrate the necessity for the proposed development at this location. The Planner considered that the proposal had the potential to result in a detrimental visual impact on these sensitive landscape receptors.

Of particular relevance to the subject appeal, the Planning Report noted that while the turbine site itself was located within an area classified as having lower landscape sensitivity, the surrounding lands to the west, south, east and northeast were

all designated as High Landscape Sensitivity Areas. The Planner specifically highlighted the site's proximity to the Lough Boora Area of High Amenity and recognised the sensitivity of the wider receiving landscape.

The subsequent appeal was dismissed by An Coimisiún Pleanála, which effectively endorsed the Council's position. The Inspector concluded that the proposed development remained contrary to the adopted Wind Energy Strategy under both the former Offaly County Development Plan 2014-2020 and the current Offaly County Development Plan 2021-2027.

The Inspector found that:

... the proposed site remains in an area not deemed suitable for wind energy development.

The Inspector further noted that while an existing two-turbine wind farm (Leabeg Wind Farm) was located nearby, the area had nevertheless been deliberately excluded from the lands identified as suitable for wind energy development under successive Wind Energy Strategies. The Inspector stated:

Despite the fact that there is an existing two-turbine wind farm in the vicinity this area was deliberately excluded for areas deemed appropriate for such development under the respective Wind Energy Strategies.

The GBWAG argued that the proposal qualified for an exception within the Wind Energy Strategy relating to community-based turbine development. However, the Inspector rejected this argument, finding that the proposed turbine was not the type of small-scale community-related turbine envisaged by the Development Plan. The Inspector concluded that:

... the proposed development appears to be, at this stage, a 'community' turbine in name alone.

Importantly, the Inspector found that the Council's original refusal was justified, stating:

... the decision by the planning authority to refuse permission was a reasonable decision and one that was consistent with the plans and objectives of the Offaly County Development Plan 2014-2020.

The Inspector also made several findings which demonstrate that the refusal was not based on technical constraints relating to ecology, roads, noise or residential amenity. In particular:

- The Inspector concluded that the proposal should not be refused on landscape or visual impact grounds alone, largely due to the presence of the existing Leabeg Wind Farm in the immediate vicinity.
- The Inspector accepted that the proposal would not be likely to result in significant adverse biodiversity impacts and accepted the conclusions of the submitted Ecological Impact Assessment.
- The Inspector concluded that the proposed development would not have any undue adverse impact on the road network and that any outstanding road concerns could be addressed by condition.
- The Inspector found that the turbine would not result in any significant adverse noise impact on nearby residential properties.
- The Inspector further concluded that shadow flicker impacts could be appropriately mitigated through planning conditions.
- The Inspector screened the proposal for Appropriate Assessment and concluded that the development would not be likely to have significant effects on any European site, either alone or in combination with other plans or projects.

Notwithstanding the generally favourable findings in relation to these environmental and technical matters, the Inspector ultimately recommended refusal on the basis that the proposal conflicted fundamentally with the adopted Wind Energy Strategy and the spatial planning framework for wind energy development in County Offaly.

In adopting the Inspector's recommendation, An Coimisiún Pleanála refused permission and concluded:

The site is not located in an area identified for wind energy development in the Development Plan. It is considered that the proposed development would materially contravene Policy CAEP-38 and Objective CAEO-05 of the Offaly County Development Plan 2021-2027 and would, therefore, be contrary to the proper planning and sustainable development of the area.

The Rin, Ferbane decision is particularly relevant to the subject appeal as it demonstrates that both Offaly County Council and An Coimisiún Pleanála have recently attached substantial weight to the locational provisions of the Offaly Wind Energy Strategy. The decision confirms that compliance with the spatial framework established by the Wind Energy Strategy remains a fundamental consideration in the assessment of wind energy proposals and that proposals located outside designated areas may be refused notwithstanding favourable findings in relation to ecology, roads, noise, shadow flicker and Appropriate Assessment.

4.2.2.1 Rin, Ferbane Wind Energy Converter – OCC Ref. 24/60326 / ACP Ref. PL19.321244

A further recent wind energy application within County Offaly relates to a proposed wind energy converter development at Rin, Ferbane, County Offaly, submitted under Offaly County Council Ref. 24/60326 and subsequently considered by An Coimisiún Pleanála under ACP Ref. PL19.321244.

This application is of particular relevance as it represented a further application on the same subject site following the previous refusal under OCC Ref. 21/306 / ACP Ref. PL19.311043. The previous proposal related to one 4.2MW wind turbine with an overall tip height of up to 150m. The later application proposed one Enercon E138 wind energy converter on an 81m tower, with an electrical rating of 4.5MW and an overall tip height of 149.38m, together with hardstanding, underground cabling, substation building, internal access track, site entrance and associated ancillary infrastructure.

The Offaly County Council Planner's Report expressly recorded the earlier refusal history and noted that the previous decision had been refused by both Offaly County Council and An Bord Pleanála on the basis that the site was not located within an area identified for wind energy development and that the proposal would materially contravene the relevant Offaly County Development Plan wind energy policies and objectives.

Offaly County Council again refused permission for the proposed development. The Council's reason for refusal stated:

Objective CAEO-03 of the Offaly County Development Plan 2021-2027 states that it is an objective of the Council to achieve a reasonable balance between responding to government policy on renewable energy and in enabling the wind energy resources of the county to be harnessed in an environmentally sustainable manner. Policy CAEP-38(b) states that the Council shall have regard to 'Areas Open for Consideration for Wind Energy Developments' in the Wind Energy Strategy Designations Map from the County Wind Energy Strategy, and Objective CAEO-05 (2) states that, in all other areas, wind energy developments shall not normally be permitted – except as provided for under relevant exemption provisions in the Planning and Development Regulations 2001 (as amended). The site is not located in an area identified for wind energy development in the Development Plan. It is considered that the proposed development would materially contravene Policy CAEP-38 and Objective CAEO-05 of the Offaly County Development Plan 2021-2027 and would, therefore, be contrary to the proper planning and sustainable development of the area.

The Planner's Report is also notable in that Offaly County Council expressly distinguished between the applicant's characterisation of the project as a small-scale / community-led renewable energy proposal and the physical reality of the turbine proposed. While the Council acknowledged that the proposed 4.5MW output may fall within certain small renewable energy generation definitions for support-scheme purposes, it concluded that, in the context of Development Plan Objective CAEO-05, a turbine of approximately 150m tip height was not a small-scale turbine.

The Planner's Report also relied on the previous Commission Inspector's reasoning under ACP Ref. PL19.311043, where it had been concluded that a turbine of this scale could not reasonably be described as a small-scale turbine of the type envisaged for areas not deemed suitable for wind energy development. Offaly County Council therefore concluded that the subject site remained within an "Area Not Deemed Suitable for Wind Energy Developments", that the relevant exemptions did not apply, and that the proposed development should again be refused.

The Planning Report also identified further local sensitivities. The site was stated to be located within an area of low landscape sensitivity, but adjoining lands to the west, south and east were located within the Lough Boora Area of High Amenity and lands of high landscape sensitivity. The Council considered that the applicant had failed to sufficiently demonstrate the necessity to develop the proposed single turbine at the chosen location, given the proximity of these high sensitivity lands and the potential for detrimental visual impact.

The Council also noted archaeological concerns raised by the Department of Housing, Local Government and Heritage. The Department advised that the proposed development was located within an area of high archaeological potential and that, given the scale, extent and location of the development, it could impact on subsurface archaeological remains. The Department recommended further archaeological assessment, including geophysical survey and targeted test excavation, before a planning decision was taken.

It is acknowledged that An Coimisiún Pleanála subsequently overturned the Council's refusal and granted permission. The Commission accepted that the proposal was located outside an "Area Open for Consideration for Wind Energy Development" and noted that the planning authority considered the development to be a material contravention of the Development Plan. However, the Commission relied on its powers under section 37(2)(b)(iii) of the Planning and Development Act 2000, as amended, and granted permission having regard to national climate policy, Climate Action Plans 2024 and 2025, the revised National Planning Framework, the community-owned nature of the project, and the absence of significant adverse environmental, amenity or heritage constraints identified at that location.

The Commission's decision is therefore of mixed relevance. On one hand, it demonstrates that the Commission may, in a particular case, exercise material contravention powers to permit a renewable energy proposal outside an area identified as open for consideration. On the other hand, the case concerned a single community-owned turbine located beside an existing two-turbine wind farm, in an area where the Commission found no significant environmental or heritage constraints. It is therefore materially distinguishable from the subject Ballincor Wind Farm proposal, which comprises a substantially larger eleven-turbine wind farm, with turbines up to 180m tip height, BESS infrastructure, grid connection works and a much broader range of unresolved site-specific environmental, landscape, hydrological, ornithological, noise and residential amenity concerns.

Accordingly, this case should not be treated as a direct precedent for granting permission for the subject application. Rather, it is relevant because it confirms that Offaly County Council has recently maintained a consistent planning position that wind energy development on lands outside the Wind Energy Strategy areas materially contravenes the Development Plan. It also demonstrates that where the Commission departs from that position, it does so only following a careful and

fact-specific assessment of scale, community ownership, existing wind energy context, environmental constraints and the statutory climate policy framework.

4.2.3 Stonestown to Clondallow Grid Connection – OCC Ref. 18/230

A notable item of associated renewable energy infrastructure planning history within County Offaly relates to planning application Ref. 18/230, submitted by Galetech Energy Developments Cloghan Limited.

The application sought permission for approximately 12.5km of 38kV electricity transmission line from the permitted Cloghan Wind Farm substation to the existing electricity substation at Clondallow. The proposed development comprised approximately 8.5km of underground line and approximately 3.7km of overhead line, including underground ducting, joint bays, communication chamber bays, sheath link boxes, inspection chambers, directional drilling at a railway crossing along the N62, and three overhead powerlines suspended from wooden poles with a maximum height of 16m. The application was accompanied by an EIAR / EIS assessing the grid connection as part of the wider wind farm project context.

Offaly County Council did not determine the application by grant at first instance, but instead required the applicant to submit significant further information. This is relevant to the subject application because it demonstrates that grid connection infrastructure associated with renewable energy development remains subject to detailed planning scrutiny and is not automatically acceptable merely because it facilitates renewable energy generation.

The Planner's Report identified a range of issues arising from the proposed grid connection, including proximity to the Rapemills River flood zone, works through rural roads and private lands, third-party concerns regarding public consultation, disturbance during construction, potential effects on wildlife, electromagnetic fields, and the relationship between the grid connection and the permitted wind farm. The report also notes that internal reports from the Area Engineer, Environment Section and Road Design each requested further information.

Of particular relevance to the subject Ballincor Wind Farm is the treatment of alternatives and the routing of grid infrastructure. The Planner's Report records that the applicant considered alternative substation options and that the preferred Dallow route was selected despite the availability of other grid options. It was also noted that previous Commission assessment had considered an underground grid connection to Dallow substation unlikely to have significant environmental effects, but the Council nevertheless required the current application to be supported by sufficient project-specific information.

This case is not relied upon as a direct precedent for refusal. However, it is relevant context for the subject application, which includes a substantially longer grid connection route of approximately 12.23km, joint bays, trenching and associated works. The Stonestown to Clondallow case demonstrates that grid connection infrastructure must be assessed as development in its own right, including in respect of construction effects, road impacts, hydrology, watercourse interfaces, cumulative effects, public consultation and route alternatives.

5.0 The proposed development

The applicant provides a general description of the proposed development within the Planning Application Form, public notices, and accompanying Planning Statement. While further detail is dispersed across the Environmental Impact Assessment Report (EIAR) and supporting technical documentation, the overall presentation of the proposal remains fragmented and not readily accessible in a single, clear and consolidated format. This lack of clarity is particularly notable given the scale, technical complexity, and geographic extent of the proposed wind energy development.

Notwithstanding the absence of a concise and coherent standalone description, the proposed development can be summarised as comprising the following principal elements:

- A request for planning permission for a large-scale onshore wind energy development, including a defined construction period, an operational lifespan of up to approximately 30–40 years, and subsequent decommissioning and site reinstatement;
- A wind farm comprising multiple utility-scale wind turbines, each of substantial height, with associated foundations and crane hardstanding areas;
- A central on-site electrical substation compound, including control buildings, transformers, switchgear, and associated electrical infrastructure;
- A grid connection involving underground cabling extending from the wind farm to an existing or proposed connection point on the national electricity network, including works within public roads and lands outside the main turbine site;
- An internal site layout extending across a broad rural landholding, comprising multiple land parcels connected via new and upgraded access infrastructure.

The proposed wind farm and associated infrastructure include, but are not limited to, the following components:

- A series of large-scale wind turbines mounted on reinforced concrete foundations, with associated crane hardstandings and assembly areas;
- New internal access tracks and the upgrading of existing agricultural and forestry tracks to facilitate construction and operational access;

- Site entrances and junction upgrades onto the public road network, including potential widening works, visibility improvements, and temporary traffic management measures;
- An on-site electrical substation compound, including control buildings, transformers, circuit breakers, and associated plant;
- Underground electrical cabling connecting turbines to the on-site substation and onward to the external grid connection point, including trenching and, where required, horizontal directional drilling (HDD) beneath sensitive features such as watercourses and roads;
- Temporary construction compounds, including site offices, welfare facilities, laydown areas, and material storage zones;
- Permanent and temporary drainage infrastructure, including attenuation measures and watercourse crossings;
- Ancillary infrastructure such as meteorological masts, communication systems, and SCADA equipment;
- Site security measures, including fencing, gates, and CCTV infrastructure;
- Landscaping, reinstatement, and ecological mitigation measures proposed as part of the development; and
- All associated site development works, including excavation, earthworks, spoil management, and reinstatement of lands following construction.

The proposed development extends across a geographically dispersed rural area and involves both on-site and off-site works, particularly in respect of the grid connection and access arrangements. The layout is characterised by a spread of turbines and infrastructure across a wide landscape, interconnected by a network of tracks and cabling, resulting in a development of significant spatial extent and visual presence.

Taken together, the proposal constitutes a substantial utility-scale energy infrastructure project, the full extent, interaction, and cumulative effects of which are not presented in a singular, clear, and transparent manner within the application documentation. This fragmented approach to describing the development gives rise to difficulties in fully understanding the scale, intensity, and overall impact of the proposal.

6.0 Validation, technical and/or planning law concerns arising from the planning application

6.1 Repeated lodgement, withdrawal and invalidation of previous applications

A preliminary procedural concern arises from the recent planning history of the subject application. The current application appears to have been lodged only after two earlier attempts by the applicant within a short timeframe in April 2026, comprising one withdrawn application and one application subsequently deemed invalid by An Coimisiún Pleanála.

The first application, ACP Ref. 324220, was lodged by RWE Renewables Ireland Limited on 17 April 2026 and was subsequently withdrawn by the applicant on 20 April 2026, within three days of lodgement. A further application was then lodged on 24 April 2026 under ACP Ref. 324246 and was subsequently deemed invalid. The current application, ACP Ref. 324279, was thereafter lodged and accepted as valid on what appears to have been the applicant's third attempt.

The GBWAG does not suggest that the withdrawal or invalidation of previous applications automatically renders the current application invalid. However, the sequence of events is relevant to the Commission's assessment of the procedural robustness and completeness of the application now before it. The repeated lodgement of substantially the same strategic infrastructure project within a compressed period raises legitimate concern as to whether the current application fully resolves the issues which led to the earlier withdrawal and invalidation.

This concern is heightened by the scale and complexity of the proposed development. The application comprises eleven wind turbines of up to 180 metres tip height, a 110kV substation, BESS infrastructure, a 12.23km grid connection route, turbine delivery works, borrow pits, compounds, internal access tracks, felling, hedgerow removal, peat deposition, drainage works and a range of ancillary infrastructure across two county administrative areas. In such circumstances, accuracy and consistency in public notices, drawings, consents, EIAR documentation, NIS documentation, site boundaries and project particulars are fundamental to public participation and lawful assessment.

The absence of published reasons for the withdrawal of the first application and the invalidation of the second application also limits the ability of third parties to understand what defects arose and how they were addressed in the current submission. This places particular importance on the Commission undertaking a careful review of the current application documentation to ensure that no residual inconsistencies, omissions or procedural deficiencies remain.

Accordingly, while this procedural history is not relied upon as a standalone basis for refusal, it forms an important part of the context in which the current application should be assessed. The GBWAG respectfully submits that the Commission should apply particular scrutiny to the completeness, consistency and clarity of the current application, including the development description, public notices, red-line boundary, landowner consents, design flexibility documentation, EIAR/NIS scope and all works necessary to deliver the proposed development.

6.2 Adequacy of development description, public notices and public understanding

Our client raises concern regarding the adequacy of the development description, public notices and overall public understanding of the proposed development having regard to the scale, complexity and multi-component nature of the

application. The proposed development is not a single compact wind farm proposal but a substantial strategic infrastructure project extending across two counties and comprising a wide range of interrelated works, including eleven wind turbines of up to 180 metres tip height, turbine foundations and hardstanding areas, a 110kV on-site substation, Battery Energy Storage System infrastructure, internal access roads, floating roads, borrow pits, temporary compounds, met mast, underground cabling, grid connection works, joint bays, turbine delivery accommodation works, public road works, felling, hedgerow removal, peat deposition, drainage works and biodiversity enhancement measures.

The Site Notice is lengthy and attempts to describe the various components of the proposed development. However, the very length and technical nature of the notice illustrate the difficulty faced by members of the public in understanding the true nature, extent and practical implications of the proposal. The development description extends across numerous bullet points and includes detailed references to turbine parameters, grid connection works, joint bays, road works, BESS infrastructure, control buildings, borrow pits, construction compounds, vegetation removal and permanent grid infrastructure. While the notice may list many of these components, the GBWAG submits that the statutory objective of public notification is not merely to enumerate development elements, but to ensure that affected members of the public can reasonably understand what is being proposed and how it may affect them.

This concern is heightened by the fact that the proposed development extends across the administrative areas of both Offaly County Council and Tipperary County Council, with the wind farm site located in named townlands in both counties and the grid connection route extending for approximately 12.23 kilometres to the existing Dallow 110kV substation. The proposed grid connection is itself a substantial element of the project, involving works along public roads and private lands, including the installation of 17 joint bays across a wide geographical area. The practical impacts of such works would not be confined to the turbine site but would extend through multiple townlands, road corridors and communities.

The GBWAG further notes that the application includes design flexibility in respect of the turbine tip height, rotor diameter and hub height. The Site Notice expressly states that certain details of the proposed development are unconfirmed, namely the turbine tip height, rotor diameter and hub height, and that an opinion on unconfirmed details accompanies the application. While design flexibility may be permissible in principle, it adds an additional layer of complexity for the public. Members of the public are not being asked to consider a fixed turbine model, but a range of turbine parameters which may have differing implications for landscape and visual impact, shadow flicker, noise, aviation, transport, ecology and ornithology.

A further concern arises from the treatment of turbine delivery route works. The Site Notice includes reference to turbine delivery accommodation works, road surfacing works, temporary wall and vegetation removal, and the laying of load-bearing surface at Sharavogue crossroads. However, the Planning Statement indicates that certain works required within the public road corridor to accommodate the proposed turbine delivery route do not form part of the permission being sought and will instead be subject to separate consent. This distinction is not readily apparent to an ordinary member of the public reading the Site Notice. In circumstances where those works are necessary to enable delivery of turbine components to the site, the separation between works assessed in the EIAR and works for which permission is sought creates uncertainty regarding the full extent of the development before the Commission.

The same issue arises in respect of the proposed operational duration and permanent infrastructure. The Site Notice states that a 35-year operational life is sought for the wind farm and associated works, but that the proposed on-site substation and grid connection will remain as permanent infrastructure forming part of the Irish national grid and will not be subject to the decommissioning requirement. This is a material point for public understanding. The public is not merely being asked to consider a time-limited wind farm, but also permanent grid infrastructure which would remain in place after turbine decommissioning.

The GBWAG does not suggest that every technical detail must be explained in a roadside notice. However, for a project of this scale and complexity, public notification must be sufficiently clear to allow potentially affected persons to understand the development, identify whether they are affected, access the relevant documents and make an informed submission within the statutory period. Where a development is spread across two counties, multiple townlands, public road corridors and private lands, and includes both temporary, operational and permanent elements, the need for clarity is especially acute.

The inclusion of RED III procedures, a completeness check, SID provisions, design flexibility under section 37CD, a 10-year permission period, a 35-year operational life, permanent grid infrastructure and separate future consents for certain delivery route works creates a complex consenting context. The GBWAG submits that the Commission should carefully consider whether the application documentation and public notices, when read as a whole, provided clear, coherent and accessible public notice of the full development and its practical implications.

In particular, the Commission should satisfy itself that affected residents and road users were adequately informed of: the full geographical extent of the proposed wind farm, grid connection and turbine delivery works; the distinction between works for which permission is now sought and works assessed but to be consented separately; the implications of unconfirmed turbine dimensions; the permanent nature of the substation and grid connection; the nature and scale of the BESS infrastructure; and the potential effects arising across the wind farm site, grid connection route and road network.

In the absence of such clarity, the GBWAG submits that the public participation process is materially weakened. The purpose of public notice is not fulfilled where members of the public are required to piece together the true extent of the proposed development from a lengthy Site Notice, a Planning Statement, EIAR chapters, appendices, design flexibility documentation and future consenting references. For these reasons, the GBWAG submits that the Commission should

treat the adequacy of the public notice and development description as a material procedural concern in its assessment of the application.

6.3 Project splitting / fragmentation of turbine delivery route works

A further procedural concern arises in respect of the treatment of turbine delivery route works. The proposed development is dependent upon the delivery of very large turbine components to the site, including turbine blades, tower sections, nacelles and associated abnormal loads. The works necessary to facilitate such delivery are therefore not ancillary in a remote or optional sense; they are integral to the ability to construct the proposed wind farm.

The Site Notice refers to turbine delivery accommodation works at Sharavogue crossroads, including road surfacing works, temporary wall and vegetation removal, and the laying of a load-bearing surface to provide a minimum running and clearance width. However, the Planning Statement also states that certain works required within the public road corridor to accommodate the turbine delivery route, including hedge or tree cutting, relocation of powerlines/poles, lampposts, signage and local road widening, have been identified and assessed in the EIAR but that permission for these works will be sought separately.

This creates a material lack of clarity as to the full scope of works for which development consent is now being sought. In practical terms, the public is asked to assess the wind farm as a whole, while certain works necessary to physically enable its construction are deferred to a separate consenting process. This risks fragmenting the assessment and consenting of the project and makes it more difficult for affected residents, road users and landowners to understand the full extent of works that may affect them.

The GBWAG does not dispute that certain road-opening licences, temporary traffic management approvals or operational road consents may ordinarily be dealt with separately. However, where physical works such as vegetation removal, road widening, relocation of roadside infrastructure or accommodation works are necessary to permit the delivery of turbine components, those works form part of the overall project and should be clearly identified, assessed and consented in an integrated manner.

The concern is particularly acute in this case given the scale of the turbine components, the 12.23km grid connection route, the rural road network, and the extent of associated enabling works required across a wide geographic area. The distinction between works assessed in the EIAR and works for which permission is actually sought is not sufficiently clear to the ordinary reader of the Site Notice or planning documentation.

Accordingly, the GBWAG submits that the treatment of turbine delivery route works gives rise to uncertainty regarding the full extent of the proposed development and the ability of the project to proceed lawfully and practically if consent for those works is not obtained. At minimum, the Commission should require clarification as to which turbine delivery works are included within the current application, which are excluded, what separate consents are required, and whether any excluded works are necessary to construct the wind farm as proposed.

6.4 Design flexibility and lack of final turbine specification

A further concern arises in respect of the applicant's reliance on design flexibility and the absence of a final confirmed turbine specification at application stage. The proposed development is not assessed on the basis of a single fixed turbine model, but rather within a range of turbine parameters, including a blade tip height between 179.5 metres and 180 metres, rotor diameter between 149 metres and 163 metres, and hub height between 98.5 metres and 105 metres.

The Site Notice expressly confirms that certain details of the proposed development are unconfirmed, namely the turbine tip height, rotor diameter and hub height. The Planning Statement further states that An Coimisiún Pleanála issued an opinion under the design flexibility provisions allowing these turbine details to be confirmed after the application has been made and decided.

The GBWAG does not dispute that design flexibility may be permissible in principle. However, where such flexibility is sought for a wind energy development of this scale, the Commission must be satisfied that the EIAR has assessed the true worst-case scenario for each relevant environmental discipline. The final turbine selected may materially influence landscape and visual effects, shadow flicker, operational noise, collision risk, blade clearance, transport requirements, aviation considerations and the effectiveness of mitigation measures.

This issue is particularly important because different environmental topics may have different worst-case turbine scenarios. The largest rotor diameter may be most relevant to shadow flicker and collision risk; the tallest overall tip height may be most relevant to landscape and visual impact; hub height and rotor configuration may influence acoustic output and blade clearance; and final component dimensions may affect turbine delivery route requirements. It is therefore not sufficient for the applicant to assess a general turbine envelope unless it is clearly demonstrated that the worst-case scenario has been identified and robustly assessed for each topic.

The reliance on post-consent confirmation also reduces public certainty. Affected residents and third parties are being asked to participate in the application process without knowing the precise turbine model, final rotor diameter, final hub height or final turbine operating characteristics. These details are directly relevant to how the development would be experienced in practice over its proposed 35-year operational life.

Accordingly, the GBWAG submits that the Commission should apply particular scrutiny to the design flexibility sought in this case. The applicant should be required to demonstrate, in clear and topic-specific terms, that the EIAR, NIS and all supporting assessments have assessed the worst-case environmental effects arising from the full turbine parameter range. In the absence of such certainty, the Commission cannot be satisfied that the final turbine specification would not give rise to materially different or greater effects than those assessed in the application documentation.

6.5 Inadequate / inconsistent receptor identification

A further concern arises in respect of receptor identification and the consistency of the receptor datasets relied upon across the application documentation. The identification of residential and sensitive receptors is fundamental to the assessment of noise, shadow flicker, landscape and visual effects, residential amenity, setback compliance and the operation of proposed mitigation measures.

In this regard, the shadow flicker chapter provides a clear example of internal inconsistency. The EIAR states that a total of 126 sensitive receptors were identified within the 1.63km shadow flicker study area and are presented in Table 16-1. However, the assessment later states that 81 receptors "of the 129 no. included in the modelling assessment" would experience some level of daily shadow flicker. This discrepancy between 126 identified receptors and 129 receptors included in the modelling assessment requires clarification.

The issue is not merely numerical. If the correct number is 126, then the reference to 129 receptors suggests that additional receptors may have been modelled but not clearly identified in the receptor schedule. Conversely, if the correct number is 129, then the receptor schedule may be incomplete or the basis for inclusion and exclusion may not be fully explained. In either case, the inconsistency undermines confidence in the reliability and transparency of the assessment.

This is particularly important where the proposed mitigation relies on accurate receptor identification and pre-programmed receptor co-ordinates. For example, the proposed shadow flicker shutdown system depends on identifying the properties capable of being affected and accurately programming their relationship to the turbines. Any omission, misclassification or inconsistency in the receptor dataset could therefore have practical consequences for the protection of residential amenity.

The same concern applies more broadly across the EIAR. Residential receptor identification underpins the assessment of noise impacts, setback distances, visual effects and amenity impacts. Where different chapters or appendices rely on differing receptor numbers, naming conventions, modelling assumptions or receptor schedules, it becomes difficult for affected residents, third parties and the Commission to verify whether all relevant dwellings and sensitive properties have been consistently assessed.

The GBWAG therefore submits that the Commission should require a complete and reconciled receptor schedule identifying all residential and sensitive receptors considered across the EIAR, including their coordinates, planning status, assessment status, and the topic chapters in which they are assessed. In the absence of such clarification, the Commission cannot be fully satisfied that all affected receptors have been properly identified, assessed and protected.

6.6 Insufficient certainty regarding BESS safety, emergency response and fire management

A further concern arises in respect of the level of certainty provided regarding the proposed Battery Energy Storage System ("BESS") infrastructure, fire safety strategy and emergency response arrangements. The application includes a BESS Fire Risk Assessment and therefore this is not a case where BESS fire risk has been wholly omitted. However, the GBWAG submits that the documentation does not provide sufficient certainty at application stage regarding the final fire safety design, emergency response procedures, contaminated residue management and surrounding-area evacuation implications.

The proposed BESS is a substantial element of the overall development, comprising 90 battery energy storage containers, 15 MV inverter containers, auxiliary transformer, control building, switchgear room, underground cabling, water storage tank, security infrastructure and associated works. The Fire Risk Assessment acknowledges that the facility involves high DC current and lithium-ion battery cells and states that this may warrant the facility being considered complex, notwithstanding its physical size and layout.

The Fire Risk Assessment also identifies a number of credible fire and emergency risks, including overheating lithium-ion battery cells, container fire, explosive atmosphere within a container, fire involving transformers, toxic gases, hydrogen fluoride gas, toxic smoke, stranded electrical energy, DC arc risks, electrocution risks, contaminated fire residues and environmental risks arising from toxic smoke and fire-damaged components. These matters are significant and require a high degree of clarity in the planning assessment.

While the assessment ultimately concludes that the fire risk would be tolerable, that conclusion is expressly dependent upon the implementation, installation and maintenance of all monitoring, controls, training, detection systems and suppression measures. A number of these matters remain subject to future detailed design, future consultation and operational-stage procedures. In particular, the report states that the design and specification of mechanical and electrical systems, including fire alarm and suppression systems, must be developed at the appropriate stage in consultation with

specialist designers. The Emergency Action Code for lithium-ion batteries is also stated to be subject to future determination in consultation with a HAZNO consultant.

The same concern arises in respect of emergency response. The Fire Risk Assessment states that consultation with Tipperary Fire Service will be initiated, that a familiarisation visit will be offered prior to commissioning, and that a Pre-Incident Plan and emergency procedures will be devised with the fire service. It also states that an Emergency Action Plan for a major incident should be prepared in consultation with the local fire service, the Health and Safety Authority and other relevant authorities. These are important safeguards, but they are not fully settled or verified within the application documentation.

The GBWAG is particularly concerned that the report acknowledges that, due to the toxic nature of smoke produced from a fire involving an electricity generating facility, an evacuation plan may be required for occupants of the surrounding area. This is a material residential amenity and public safety issue. If surrounding-area evacuation may be required in certain fire scenarios, then the Commission should be provided with clear information at application stage identifying the potential evacuation zone, affected receptors, emergency alert procedure, emergency access arrangements, fire service response assumptions and responsibilities for implementation.

There is also uncertainty regarding contaminated residues and post-incident management. The Fire Risk Assessment states that firewater or extinguished contaminants would be contained within the specific container and removed later, and that traditional water-based firefighting would not generally be applied within the BESS facility. However, it also states that a waste disposal plan shall be developed to consider how toxic by-products resulting from a fire incident should be disposed of. In the GBWAG's view, such a plan should not be deferred where the development involves lithium-ion battery infrastructure at this scale.

Accordingly, while the applicant has provided a BESS Fire Risk Assessment, the GBWAG submits that the assessment leaves a number of important matters insufficiently resolved at application stage. These include the final fire alarm and suppression design, Emergency Action Code signage, fire service pre-incident planning, surrounding-area evacuation requirements, contaminated residue disposal, emergency alerting, and detailed post-incident environmental management. In the absence of further clarity, the Commission cannot be satisfied that the BESS element of the proposed development has been assessed with sufficient certainty having regard to public safety, emergency response, residential amenity and environmental protection.

If the Commission is minded to grant permission, it is respectfully submitted that strict conditions should be imposed requiring, prior to commencement, a final BESS Fire Safety Strategy, a site-specific Emergency Response Plan prepared in consultation with Tipperary Fire Service, confirmation of firewater and contaminated residue containment, an evacuation and alert protocol for surrounding receptors if required, an independently verified waste disposal plan for fire-damaged components and toxic by-products, and evidence that all fire detection, suppression, monitoring and shutdown systems have been installed, commissioned and maintained in accordance with the Fire Risk Assessment and manufacturer requirements.

6.7 Ten-Year permission and permanent grid/substation permission not adequately justified

A further procedural and planning concern arises in respect of the duration of permission sought. The applicant seeks a ten-year permission for the wind farm development, a 35-year operational life from full commissioning, and permanent permission for the on-site substation and grid connection infrastructure.

The GBWAG has addressed the substantive objection to a ten-year permission in Ground 18 of this submission. In summary, the normal duration of a planning permission is five years unless a longer period is expressly justified. In this case, the applicant has not adequately demonstrated why a ten-year permission is necessary or appropriate, particularly having regard to the sensitivity of the receiving environment, the scale of the proposed works and the level of uncertainty identified across the EIAR.

The concern is not merely procedural. A ten-year permission would allow the development to remain capable of commencement for a prolonged period after the baseline environmental assessments have been undertaken. Over such a period, ecological conditions, ornithological usage, hydrological conditions, residential occupation, cumulative wind energy development, policy context, road conditions and community circumstances may materially change. This is particularly relevant for a project located in an area identified as unsuitable for wind energy development and where the application already relies on future surveys, mitigation updates and post-consent management measures.

The position is further complicated by the proposed permanent retention of the on-site substation and grid connection infrastructure. The public is therefore not simply being asked to consider a 35-year wind farm project, but also permanent electrical infrastructure which would remain in place after the turbines are decommissioned. The planning and environmental implications of this permanent infrastructure should be clearly justified and assessed as a distinct long-term consequence of the proposal.

Accordingly, the GBWAG submits that the requested ten-year permission and permanent grid/substation permission have not been adequately justified. If the Commission is minded to grant permission, it is respectfully requested that the duration of permission be limited to five years. In the alternative, any extended permission should be subject to strict

requirements for updated environmental surveys, updated cumulative assessments, refreshed receptor data, confirmed mitigation measures and renewed verification of baseline conditions prior to commencement.

6.8 Inadequate decommissioning security / financial bond

Our client is concerned with the absence of clear, secured and enforceable financial provision for decommissioning, site restoration and environmental remediation at the end of the operational life of the proposed development.

The proposed development is not limited to turbines. It includes turbine foundations, hardstanding areas, internal access roads, floating roads, borrow pits, underground electrical cabling, a 110kV substation, grid connection infrastructure, a Battery Energy Storage System comprising 90 BESS container units, inverters, control buildings, drainage infrastructure and ancillary works. The Site Notice confirms that a 35-year operational life is sought for the wind farm and associated works, with decommissioning at the end of that period, while the on-site substation and grid connection are proposed to remain as permanent infrastructure and are not subject to the decommissioning requirement.

In circumstances where a project of this scale would operate over a 35-year period, it is essential that the Commission is satisfied that decommissioning obligations are not merely aspirational, but are supported by a robust, enforceable and financially secured mechanism. Over such a period, ownership, corporate structure, project financing, operational control and market conditions may materially change. Without an indexed financial bond, parent company guarantee, escrow arrangement or similar security, there is insufficient certainty that the full cost of turbine removal, BESS removal, waste disposal, foundation treatment, site restoration, environmental remediation and post-closure monitoring will be met by the developer or its successor.

This concern is heightened by the presence of BESS infrastructure. Decommissioning obligations in respect of battery energy storage infrastructure extend beyond ordinary removal of plant and equipment. They may involve the certified removal, transport, recycling or disposal of lithium-ion battery components, electrical equipment, contaminated residues and any fire-damaged or degraded materials. The application documentation does not appear to provide a clear financial mechanism securing these obligations.

The applicant's documentation refers to decommissioning in principle and identifies that further decommissioning measures will be prepared or implemented at the relevant time. However, a future decommissioning plan is not the same as a secured financial guarantee. The question for the Commission is not simply whether decommissioning can be described in general terms, but whether there is certainty that funds will be available and legally enforceable when the decommissioning obligation arises.

The GBWAG therefore submits that the application fails to provide sufficient certainty in respect of decommissioning liability and financial security. If the Commission is minded to grant permission, it is respectfully submitted that any permission should include a condition requiring the applicant to agree, lodge and maintain an independently costed, index-linked decommissioning and restoration bond prior to commencement of development. Such security should cover the full removal and disposal of turbines, BESS units, electrical infrastructure, ancillary equipment, waste materials and any necessary site remediation, and should be reviewed at regular intervals throughout the operational life of the development.

In the absence of such a mechanism, there is a risk that future decommissioning, restoration or remediation liabilities could fall to the local authority, landowners or the wider community. This would be contrary to proper planning and sustainable development and would fail to adequately protect the public interest over the full lifecycle of the proposed development.

6.9 Incomplete AA Screening / NIS and reliance on future mitigation

The extent to which the Appropriate Assessment Screening Report, Natura Impact Statement and supporting ecological documentation rely upon future surveys, future management plans, monitoring and adaptive mitigation to address matters which should be resolved at consent stage.

The GBWAG addresses the substantive precautionary principle and environmental uncertainty concerns in detail at Ground 14 of this submission. For the purposes of this procedural section, it is sufficient to note that the Appropriate Assessment process requires the competent authority to be satisfied, beyond reasonable scientific doubt, that the proposed development will not adversely affect the integrity of any European site, either alone or in combination with other plans or projects.

In the present case, the application documentation relies upon a suite of measures including finalised construction management procedures, surface water management controls, ecological supervision, pre-construction surveys, monitoring, adaptive management and further implementation detail at later project stages. While such measures may be appropriate as part of a robust mitigation framework, they cannot be used to defer essential assessment or to cure uncertainty which remains at the point of decision.

This is particularly important given the hydrological and ecological sensitivity of the receiving environment, the proximity of watercourses and wetland habitats, the presence of ornithological interests, and the potential for downstream or ex-situ effects. Where mitigation is central to the conclusion of no adverse effect, the Commission must be satisfied that such mitigation is sufficiently detailed, certain, enforceable and effective at the time permission is granted.

Accordingly, and having regard to the matters set out more fully in Ground 14, the GBWAG submits that the Commission should apply particular scrutiny to the AA Screening Report, NIS and supporting ecological documentation. If any material uncertainty remains as to the effectiveness of mitigation, the completeness of baseline information, or the potential for in-combination effects, the Commission cannot lawfully conclude that adverse effects on European site integrity have been excluded beyond reasonable scientific doubt.

6.10 Deficiencies in alternatives and site selection information

A further concern arises in respect of the adequacy and transparency of the alternatives and site selection information submitted with the application. The applicant's alternatives chapter states that planning policy formed part of the site selection process, alongside matters such as wind resource, environmental constraints, population density, proximity to dwellings, archaeology, landscape and visual constraints, grid access, access route availability and land ownership.

However, the Planning Statement expressly acknowledges that the proposed wind farm site is located within an area designated as "Areas Not Deemed Suitable for Wind Energy Development" under the Offaly County Development Plan and, similarly, within an area classified as "Areas Unsuitable for New Wind Energy Development" under the Tipperary County Development Plan. This creates an obvious tension within the applicant's case. If planning policy was genuinely applied as a meaningful site selection criterion, it is unclear how a site expressly identified as unsuitable for wind energy development under both relevant Development Plans survived the screening process and was ultimately selected.

The alternatives chapter does not adequately explain this contradiction. It provides a general account of national-scale GIS screening and identifies broad site selection criteria, but it does not provide a transparent comparative assessment showing why this site was selected over alternative sites located within areas open for consideration or otherwise more suitable in planning policy terms. Nor does it demonstrate that reasonable alternative locations, particularly within policy-supported wind energy areas, were assessed and discounted on environmental grounds.

This is particularly significant given the applicant's reliance on national renewable energy policy and climate targets to justify departure from the local Development Plan framework. The existence of national renewable energy need does not remove the requirement to assess reasonable alternative locations, particularly where the selected site is located in an area already identified by two planning authorities as unsuitable for wind energy development.

The GBWAG submits that the alternatives assessment is therefore insufficiently transparent and appears to be weighted towards justifying a pre-selected site rather than objectively comparing reasonable alternative locations. This undermines confidence in the site selection process and should be considered alongside the substantive policy conflict addressed in Ground 1 of this submission.

6.11 Seasonal adequacy and transparency of ecological survey baseline

A further concern arises in respect of the seasonal adequacy and transparency of the ecological survey baseline relied upon within Chapter 6 of the EIAR. The GBWAG does not suggest that all ecological surveys were undertaken outside appropriate survey windows. However, the application does not clearly demonstrate, receptor by receptor, that each relevant ecological feature was surveyed within its optimal seasonal period, nor does it provide a sufficiently clear explanation where surveys were undertaken outside optimal windows.

This is important because ecological survey timing is central to the reliability of baseline information. The detectability of protected species, breeding or resting places, larval webs, spawning habitat, mammal signs, amphibian activity and aquatic species can vary significantly depending on season, weather, water level, vegetation growth and species life cycle. Where surveys are undertaken outside optimal periods, the absence or low recording of a species may not provide the same level of confidence as a survey undertaken during the appropriate seasonal window.

Optimal Ecological Survey Periods

Ecological Feature	January	February	March	April	May	June	July	August	September	October	November	December
Breeding birds												
Wintering birds												
Kingfisher												
Marsh Fritillary												
Habitats/ Botanical												
Terrestrial Mammals												
Bat activity surveys												
Amphibians (frogs)												
Amphibians (newts)												
Reptiles												
Whorl snails												
General fisheries												
Aquatics (salmonids)												
Aquatics (lamprey)												
Aquatics (crayfish)												
Aquatics (fwpm)												

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DNV

Figure 3: Optimal Ecological Survey Periods (Source: DNV, Optimal Ecological Survey Periods, 20 January 2025)

The DNV optimal ecological survey periods indicate that different ecological features require materially different survey windows. When those periods are compared against the applicant's survey dates in Chapter 6, a number of potential timing issues arise. These do not necessarily invalidate the survey work, but they do warrant clarification and should be treated as relevant to the level of confidence that can be placed on the baseline assessment.

Ecological Feature	DNV Optimal Survey Period	EIAR Chapter 6 Survey Dates	Comment
Habitats / botanical	May–August	May, July and August 2022; June 2023; April 2024; July 2025	Largely aligned, although April 2024 falls outside the DNV optimum.
Non-volant mammals	January–May and September–December	May, July and August 2022; June 2023; April 2024; July 2025	Potential mismatch. Several surveys were undertaken in June–August, outside the DNV optimal window. Summer vegetation can reduce detectability of mammal signs, setts, couches, tracks and resting places.
Marsh Fritillary	May–June and August–September	September 2023	Generally aligned.
Bat activity surveys	May–September	Autumn 2020; spring, summer and autumn 2021; spring and summer 2022; summer and autumn 2024; spring and autumn 2025; active GCR survey September 2025	Broadly aligned, although the EIAR summary does not clearly identify the exact months for all "spring", "summer" and "autumn" survey periods.
Common Frog	January–March	Not separately dated in Table 6-3; appears addressed through general multidisciplinary surveys	Potential mismatch / transparency issue. If no dedicated January–March frog-spawn survey was undertaken, the baseline may not represent the optimal period for confirming breeding activity.
Amphibians / newts	February–May	Alpine Newt eDNA survey on 27 August 2024	Strong mismatch. August is outside the DNV optimal period for newts. This is particularly relevant where the EIAR itself states that a negative eDNA result does not necessarily confirm species absence.
Reptiles	April–June and September	Common Lizard recorded during general surveys	Partly aligned, but the EIAR does not clearly identify targeted reptile survey dates.
General fisheries	March–September	February 2022; June 2023; July 2024	Partly aligned. June and July are within the DNV general fisheries period, but February falls outside it.
Salmonids	January–February and	February 2022; June 2023; July 2024	February aligns, but June and July are outside the DNV salmonid period. This should be clarified

	October–December		where salmonid spawning, nursery or habitat suitability conclusions rely on non-optimal seasonal data.
Lamprey	August–October	February 2022; June 2023; July 2024	Potential mismatch. July is close to, but outside, the DNV optimal period, while February and June are outside it.
Crayfish	July–September	February 2022; June 2023; July 2024	July aligns. Earlier aquatic surveys are outside the optimal period.
Freshwater Pearl Mussel	July–September	February 2022; June 2023; July 2024	July aligns, but the EIAR should clearly explain the basis for excluding or discounting FWPM risk where earlier surveys were outside the optimal period.

Table 1: Comparison of EIAR Ecological Survey Dates Against Optimal Survey Periods

The clearest concerns therefore relate to non-volant mammals, amphibians, newts and certain aquatic species groups. In particular, the Alpine Newt eDNA survey was undertaken in August 2024, whereas the DNV optimal survey period for newts is identified as February to May. This is material because Chapter 6 notes that Alpine Newt was previously recorded during a TOBIN ecological survey and that eDNA sampling was subsequently undertaken to detect its presence. Chapter 6 also states that a negative eDNA result should be interpreted with caution and does not necessarily confirm species absence where eDNA is not detected or is present below the detection threshold.

The concern is compounded by the survey limitation section of Chapter 6, 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 unwadeable 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.

The GBWAG submits that this issue should be considered as part of the wider concern regarding the adequacy of the ecological baseline. The Commission should not be asked to assume that all ecological receptors have been fully and robustly characterised where the timing of certain surveys appears to fall outside recognised optimal periods, or where the EIAR does not clearly explain the implications of such timing.

Accordingly, the GBWAG requests that the Commission require clarification from the applicant identifying, for each ecological receptor, the survey dates, survey purpose, applicable optimal survey period, any seasonal limitations, weather or access constraints, and the basis upon which the applicant considers the survey effort sufficient. In the absence of such clarification, the Commission should attach reduced weight to absence-based conclusions and should apply a precautionary approach to the assessment of ecological impacts.

7.0 Grounds for Objection

The following points set out our client's 'Grounds for Objection' in respect of the proposed development. These grounds all arise from concerns raised by members of our client's group which comprises all local people who would be adversely impacted by the proposals.

7.1 Ground 1: Inappropriate Siting – Proposed Development Located in an Area Not Deemed Suitable for Wind Energy Development

The proposed development is located within lands identified as "Areas Not Deemed Suitable for Wind Energy Development" under Map No. 10 of the Offaly County Development Plan Wind Energy Strategy and similarly within lands identified as unsuitable for wind energy development under the Tipperary County Development Plan. These designations form part of the statutory development plan framework adopted by the respective planning authorities and reflect a deliberate, evidence-based and plan-led spatial strategy for wind energy development within the wider region. The identification of these lands as unsuitable for wind energy development arises from the presence of significant environmental, landscape, ecological and settlement-related constraints, including landscape sensitivity, visual amenity considerations, ecological and ornithological sensitivities, heritage and tourism considerations, the protection of scenic landscapes and the established rural settlement pattern of the area.

The Wind Energy Strategy underpinning the Offaly County Development Plan adopts a clear constraint-led and avoidance-based methodology which seeks to direct wind energy development away from environmentally sensitive and visually vulnerable landscapes and towards locations considered capable of accommodating such development without giving rise to unacceptable impacts. The strategy specifically recognises the sensitivity of the wider Birr environs, associated callows landscapes, wetlands, boglands, protected views, Areas of High Amenity and archaeological and historical landscapes. In this regard, the designation of the subject lands as unsuitable for wind energy development represents a clear expression of the planning authority's considered view that the receiving environment lacks the capacity to accommodate large-scale wind energy infrastructure without significant adverse effects.

Notwithstanding the foregoing, the applicant has advanced a proposal for a substantial industrial-scale wind energy development within these identified constraint lands and has expressly acknowledged within the Planning Statement accompanying the application that the site is located within areas deemed unsuitable for wind energy development under both the Offaly and Tipperary County Development Plans. While the applicant seeks to justify the proposal primarily by reference to national renewable energy policy and climate targets, such policy support does not negate the requirement to comply with the statutory development plan framework or the overarching requirement to ensure proper planning and sustainable development. It is submitted that the proposed development fundamentally conflicts with the adopted spatial planning strategy for the area and would materially undermine the integrity and purpose of the Wind Energy Strategy as set out within the relevant County Development Plans.

7.1.1 The Wind Energy Strategy Does Not Create a Presumption in Favour of Development

The Offaly County Development Plan 2021–2027 incorporates a dedicated County Wind Energy Strategy which forms part of the statutory development plan framework for the county and is expressly intended to guide the spatial distribution and assessment of wind energy development proposals during the lifetime of the Plan. The Strategy states that it "forms part of the Offaly County Development Plan 2021-2027" and "will guide the development of wind energy developments in the county up to 2027." The Strategy was prepared having regard to a broad range of national, regional and environmental policy documents and was informed by both Strategic Environmental Assessment ("SEA") and Appropriate Assessment ("AA"). In this regard, the Strategy expressly states that its objective is to identify areas "Open for Consideration for Wind Energy Developments" or 'Unsuitable for Wind Energy Developments' based on wind speed, access to the electricity grid and substations, and avoidance of adverse impacts on the landscape and designated sites."

The Wind Energy Strategy adopts a clear strategic, evidence-based and constraint-led methodology for determining the suitability of lands for commercial wind energy development. The Strategy confirms that the designation of lands was informed by a "step by step sieve mapping analysis of the key environmental, landscape and technical criteria" required to identify "the most suitable location for wind energy development." This methodology included consideration of:

- landscape sensitivity;
- designated European and national ecological sites;
- Areas of High Amenity;
- protected views and scenic routes;
- archaeological and heritage landscapes;
- settlement patterns and housing density; and
- environmental sensitivities identified through SEA and AA processes.



5 Identifying Suitable Areas in County Offaly for Wind Energy Development

This Wind Energy Strategy proposes that Local Authorities use a 'step by step' sieve mapping analysis of the key environmental, landscape and technical criteria which must be balanced in order to identify the most suitable location for wind energy development. This Section applies the steps below to identify suitable locations for wind energy development in development plans.

Fig. 3: The 'Methodological Step-by-Step Approach to Identification of Suitable Wind Energy Areas' (Source: Offaly County Development Plan 2021–2027 Wind Energy Strategy).

The Strategy repeatedly emphasises that environmental and landscape protection formed a central component of the designation process. In particular, the Strategy notes that “the wetlands, designated bog land areas, eskers, River Shannon and Callows and archaeological and historical landscapes are identified as being of high sensitivity in recognition of the value placed on them on account of their scenic and amenity potential.” The Strategy further confirms that these “High Landscape Sensitivity Areas have not been included in ‘Areas Open for Consideration for Wind Energy Developments’ in Map 10: Wind Energy Designations.”

Similarly, the Strategy expressly confirms that all European and National designated ecological sites “have not been included in Areas deemed ‘Open for Consideration for Wind Energy Developments’ in Map No. 10 Wind Energy Designations.” The same exclusionary approach was applied to Areas of High Amenity, with the Strategy noting that “having regard to the potential significant visual impact associated with windfarms, the specific Areas of High Amenity shown in Map No. 5 are not included in Areas deemed ‘Open for Consideration for Wind Energy Development’ on Map 10.”

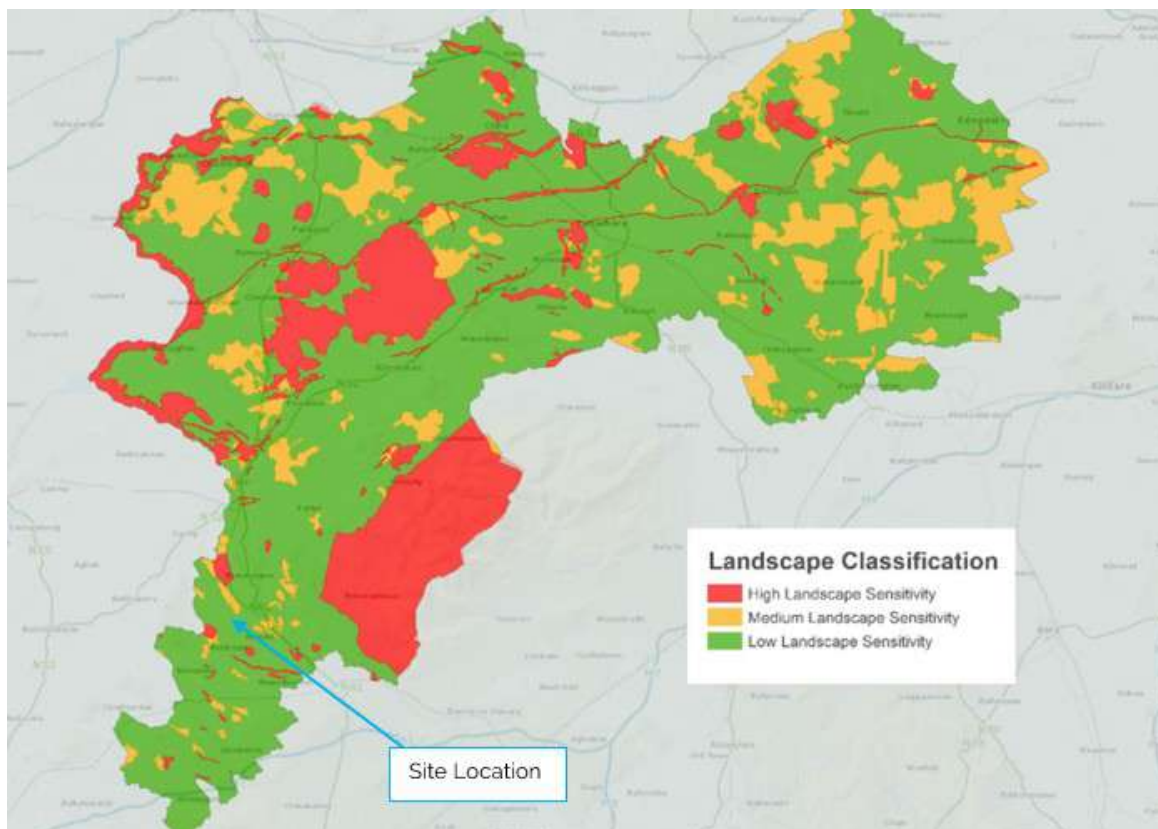


Fig. 4: Landscape Sensitivity Areas in County Offaly (Source: Offaly County Development Plan 2021–2027 Wind Energy Strategy – Map No. 3)

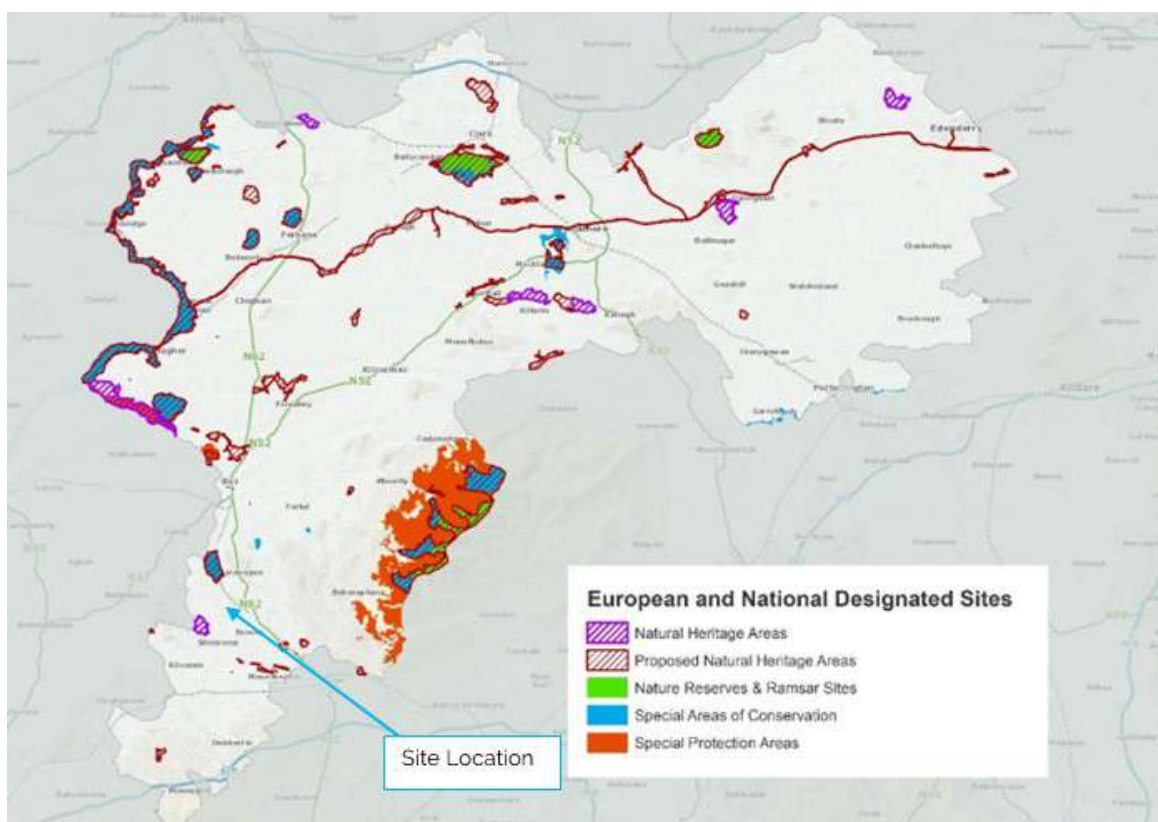


Fig. 5: European and National Designated Sites in County Offaly (Source: Offaly County Development Plan 2021–2027 Wind Energy Strategy – Map No. 4)

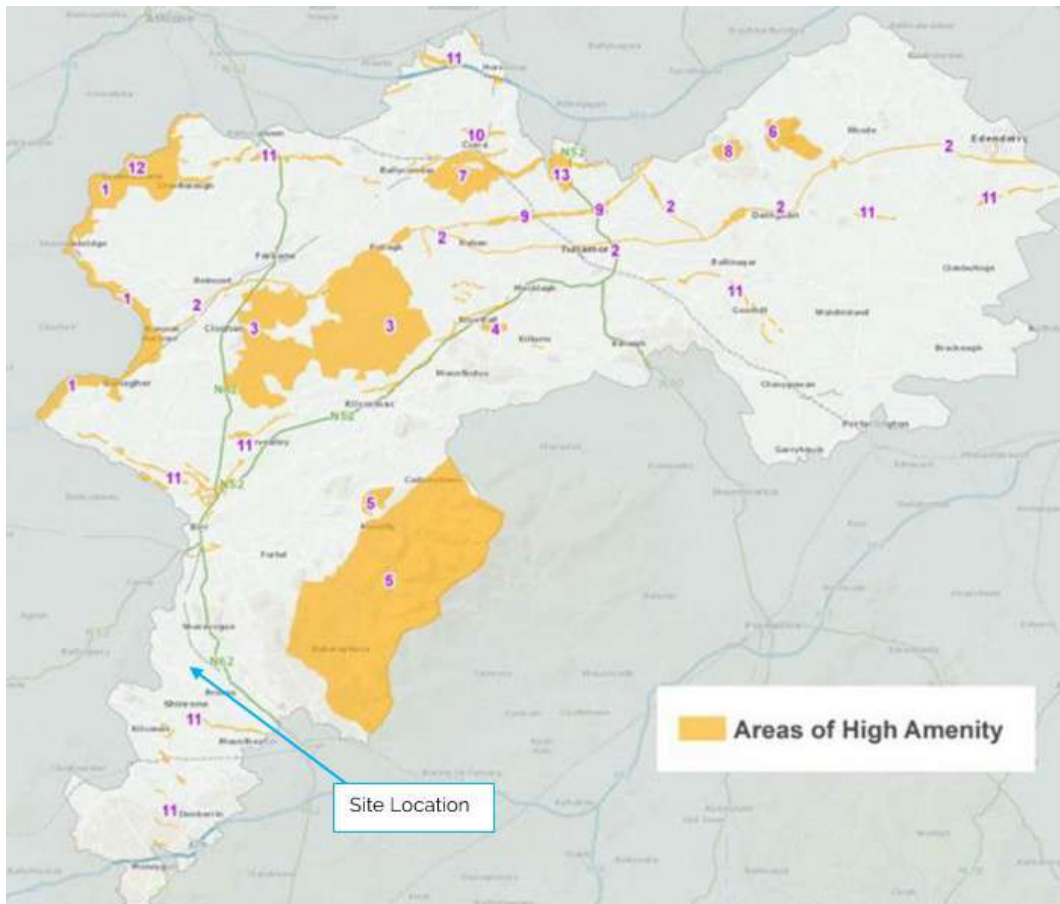


Fig. 6: Areas of High Amenity in County Offaly (Source: Offaly County Development Plan 2021–2027 Wind Energy Strategy – Map No. 5)

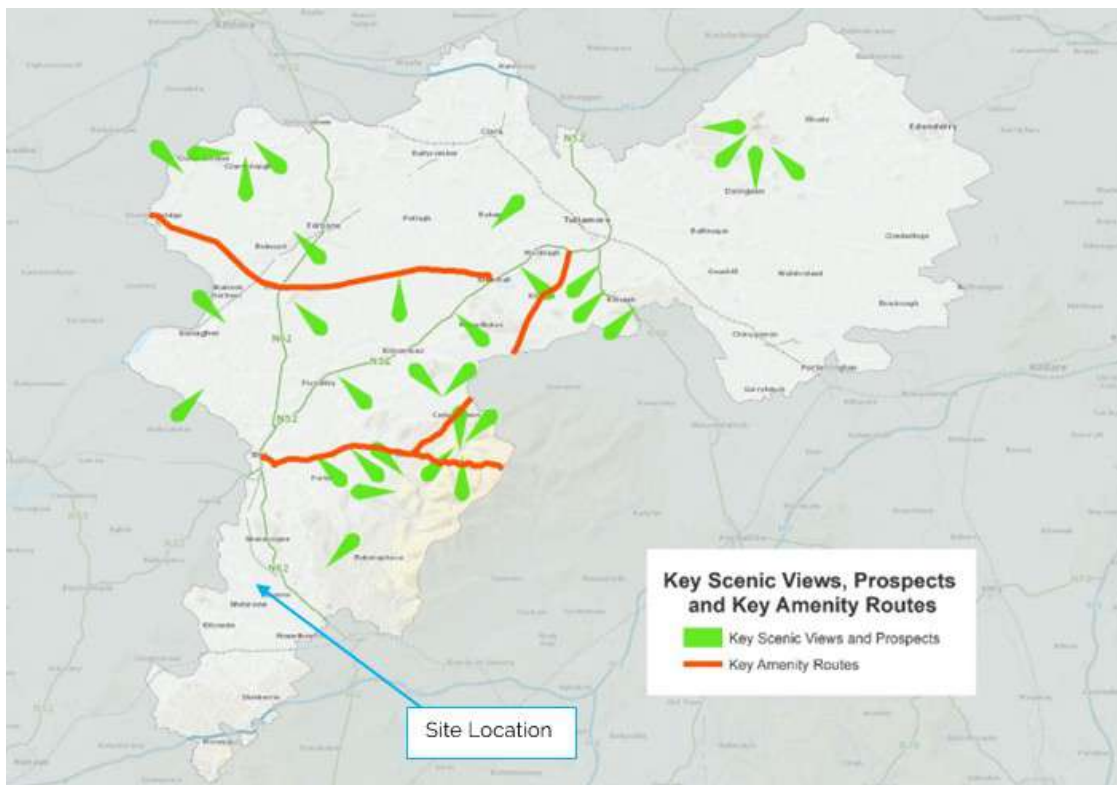


Fig. 7: Key Scenic Views, Prospects and Amenity Routes in County Offaly (Source: Offaly County Development Plan 2021–2027 Wind Energy Strategy – Map No. 6)

The Strategy ultimately identifies lands either as:

- "Areas Open for Consideration for Wind Energy Development"; or
- "Areas Not Deemed Suitable for Wind Energy Development".

Map No. 10 of the Strategy clearly identifies the subject lands associated with the proposed Ballinlough Wind Farm within areas designated "Area Not Deemed Suitable Wind Energy Development". This designation reflects the considered strategic conclusion of Offaly County Council, following environmental assessment and detailed spatial analysis, that the receiving environment lacks the capacity to accommodate large-scale commercial wind energy infrastructure without giving rise to unacceptable environmental, landscape, visual and settlement impacts.

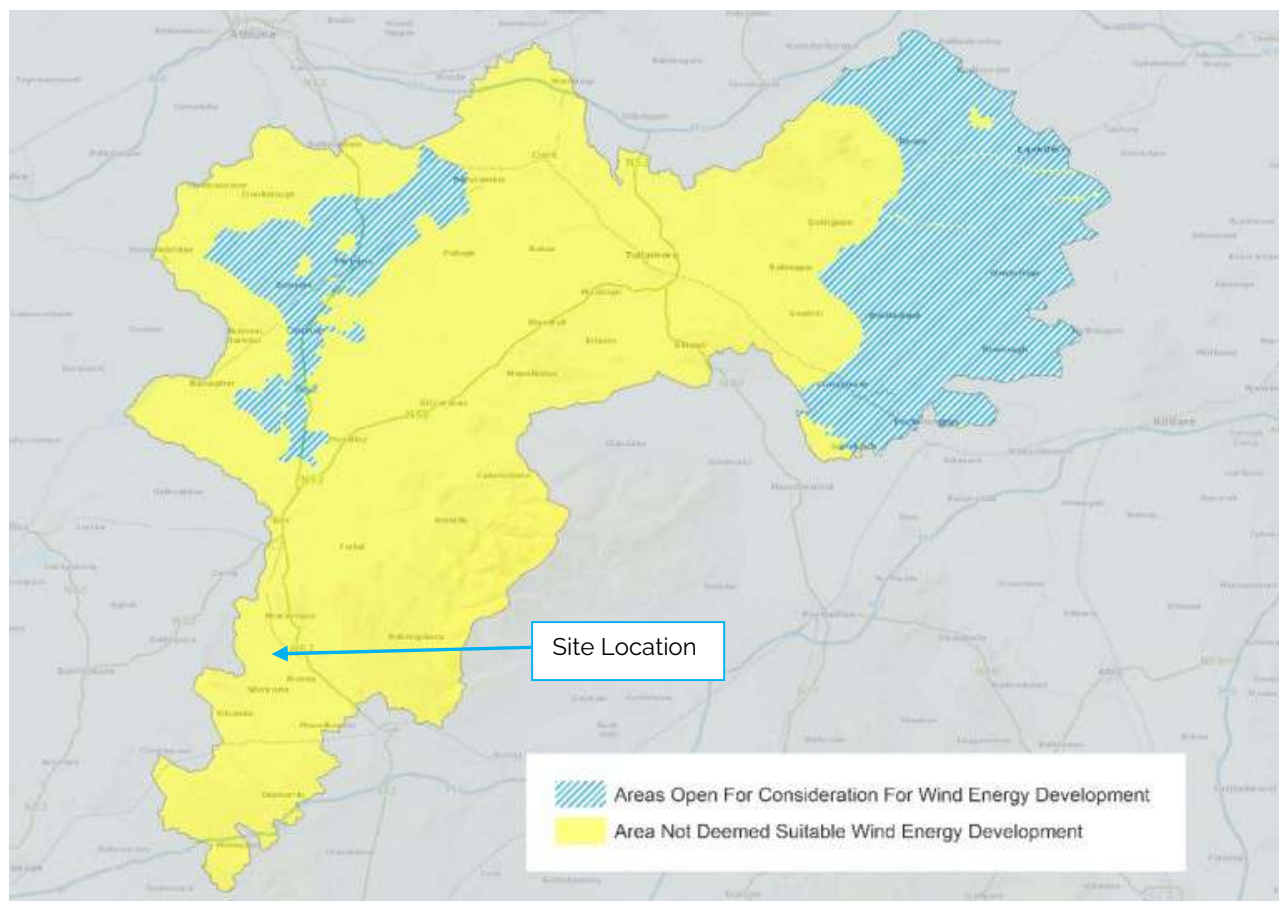


Fig. 8: Wind Energy Strategy Designations (Source: Offaly County Development Plan 2021-2027 Wind Energy Strategy – Map No. 10)

Importantly, the Wind Energy Strategy expressly confirms that areas identified as suitable are those which:

- "have fewer environmental and landscape constraints";
- "are characterised by dispersed or sparse patterns of rural housing"; and
- "are of a sufficient size to accommodate commercial wind farms and associated infrastructure."

By necessary implication, lands identified as unsuitable are lands where such conditions do not arise and where the relevant environmental, landscape, heritage, visual or residential constraints are considered incapable of satisfactorily accommodating large-scale wind energy development.

This interpretation is reinforced further within Section 8 of the Strategy which expressly states:

This area is considered to be generally unsuitable for wind farm development due to significant environmental, heritage and landscape constraints and housing density.

The proposed development therefore represents a direct conflict with the adopted spatial planning strategy and policy framework of the Offaly County Development Plan and Wind Energy Strategy. Rather than directing commercial wind energy development toward strategically identified areas considered capable of accommodating such development, the application proposes a substantial industrial-scale wind energy development within lands expressly identified by the planning authority as unsuitable following a comprehensive environmental, landscape and spatial assessment process.

informed by SEA and AA. This fundamentally undermines the integrity and purpose of the plan-led approach underpinning the Wind Energy Strategy and materially conflicts with the proper planning and sustainable development of the area.

7.1.2 Direct Conflict with the Offaly and Tipperary Development Plans

The proposed development materially conflicts with the adopted statutory planning framework of both Offaly and Tipperary County Councils. While both Development Plans support renewable energy in principle, such support is expressly conditional upon compliance with the relevant Wind Energy Strategies, environmental safeguards, landscape protections and the proper planning and sustainable development of the area. Significantly, the proposed development site is located within lands expressly identified through SEA-informed and AA-informed strategic assessment processes as unsuitable for new wind energy development under both county strategies.

7.1.2.1 Direct Conflict with the Offaly County Development Plan 2021–2027

The proposed development materially contravenes the adopted spatial strategy, environmental protection framework and Wind Energy Strategy of the Offaly County Development Plan 2021–2027. Significantly, the applicant's own documentation acknowledges that the proposed wind farm is located within lands identified as unsuitable for wind energy development under the Offaly Wind Energy Strategy. Notwithstanding this clear strategic conflict, the EIAR and Planning Statement fail to provide any substantive justification as to why the adopted statutory designation should be disregarded.

The Offaly County Development Plan establishes a strong overarching strategic objective to protect and enhance the county's environmental, ecological, landscape and natural heritage assets. Chapter 4 of the Plan sets out the Strategic Aim: "Protect and enhance Offaly's natural assets of clean water, biodiversity, landscape, green infrastructure, heritage and agricultural land."

The Development Plan repeatedly emphasises the exceptional environmental sensitivity of the county's peatlands, eskers, wetlands, river systems, designated habitats and landscapes, many of which are directly relevant to the receiving environment of the proposed development and associated infrastructure corridors.

The Plan notes that Offaly contains:

... a rich biodiversity and range of ecosystems, including its geology such as the Slieve Bloom Mountains and Croghan Hill, extensive peatlands, wetland landscapes, rivers, Grand Canal, woodlands, grasslands, eskers, trees and hedgerows.

The Plan further confirms that:

... Protecting and enhancing our biodiversity and ecosystems is vital not only for our health, well-being, tourism, attractiveness of place, and quality of life of our communities and but is also crucially important in adapting to climate change.

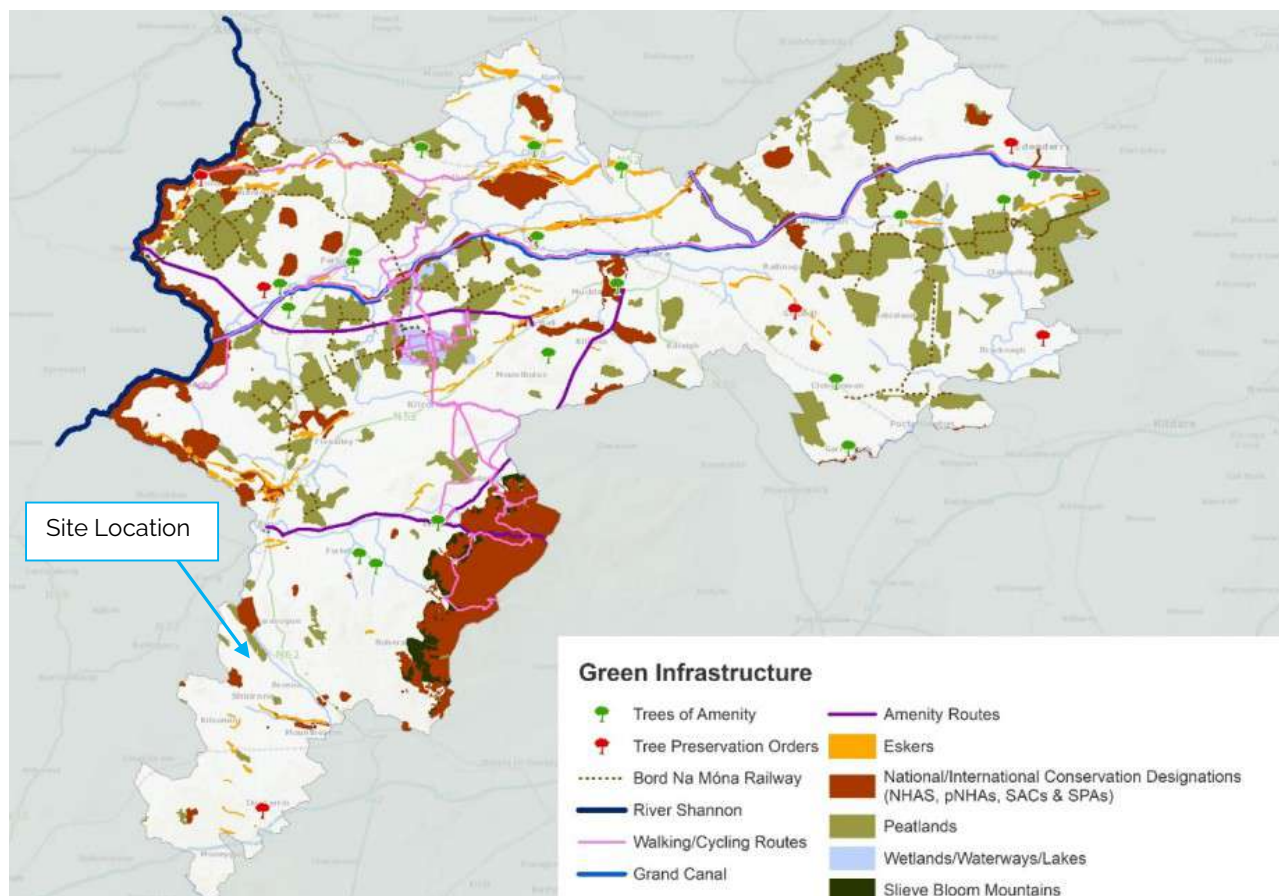


Fig. 9: County Offaly Strategic Green Infrastructure Network (Source: Offaly County Development Plan 2021–2027 – Figure 4.13)

The Development Plan identifies an extensive range of Natura 2000 sites, NHAs, pNHAs, peatlands, eskers, wetlands and protected ecological corridors throughout the county. The Plan expressly acknowledges the ecological and landscape sensitivity of these areas and requires their protection through the planning process.

In relation to European Sites, the Plan states:

A project or plan may only proceed if it can be concluded on the basis of Appropriate Assessment that there will be no adverse effects on the integrity of a Natura 2000 site.

The Plan also places particular emphasis on the protection of peatlands and wetland landscapes, recognising their role in biodiversity, climate mitigation, flood management and landscape character. The Plan notes:

Peatlands are considered to be very important ecosystems.

and further states that peatlands:

... act as important amenity areas for locals and visitors while also contributing significantly to climate change mitigation and adaptation, providing important carbon sinks, water attenuation and flooding protection.

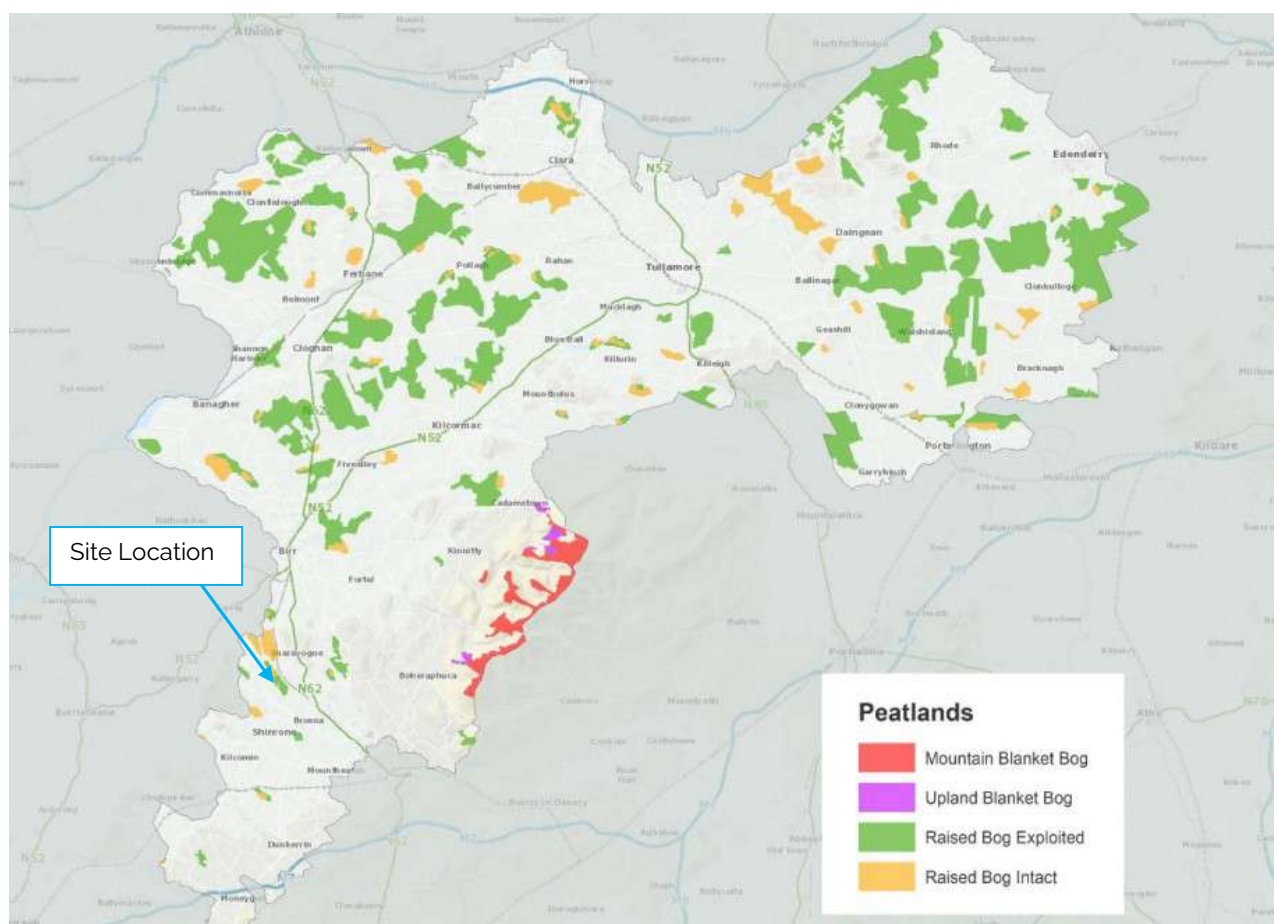


Fig. 10: Peatlands in County Offaly (Source: Offaly County Development Plan 2021–2027 – Figure 4.8)

Similarly, the Plan recognises the "unique importance of Offaly's Esker Landscape deriving from its geological, zoological, botanical, scientific and landscape value." The Plan specifically references the international importance of the Clonmacnoise Esker system and confirms the need:

... to restrict exploitation on eskers ...



Fig. 11: Location of Esker Systems in County Offaly (Source: Offaly County Development Plan 2021–2027 – Figure 4.7)

The Development Plan also establishes a strategic Green Infrastructure framework incorporating:

- SACs;
- SPAs;
- NHAs;
- peatlands;
- eskers;
- riparian corridors;
- wetlands;
- Areas of High Amenity; and
- connected ecological and recreational corridors.

The Plan expressly states that Green Infrastructure serves functions including:

... provision of habitat, increased biodiversity, ecological corridors, climate change adaptation and mitigation, water treatment, water retention, flood mitigation, improving attractiveness of place, local amenity provision, air quality improvement, noise abatement measure, health and well-being, sustainable recreational tourism and eco-tourism, cultural and heritage preservation.

The proposed development, by reason of its scale, turbine height, extent of land disturbance, grid infrastructure, drainage interventions, forestry clearance and industrialisation of the receiving environment, directly conflicts with these strategic objectives and protections.

Importantly, while the Development Plan strongly supports renewable energy and acknowledges the importance of climate action, it does so expressly within a plan-led and environmentally constrained framework. Chapter 3 of the Plan recognises that:

Site suitability is an important factor in determining the suitability of wind farms having regard to possible adverse impacts associated with, for example, residential amenities, landscape, including views or prospects, wildlife, habitats, designated sites, protected structures or bird migration paths and compatibility with adjoining land uses.

The Plan further states:

The Council is therefore required to achieve a reasonable balance between responding to overall positive Government policy on renewable energy and enabling the wind energy resources of the Planning Authority's area to be harnessed in a manner that is consistent with proper planning and sustainable development.

Critically, the Development Plan confirms that:

A County Wind Energy Strategy forms part of this Development Plan. The Strategy constitutes a plan led approach to wind energy development in County Offaly and sets out areas 'open for consideration' for wind energy developments and considerations for the evaluation of wind energy planning applications.

The applicant's proposal fundamentally conflicts with this statutory "plan led approach". The lands were expressly assessed by Offaly County Council through SEA-informed and AA-informed strategic analysis and were determined to be unsuitable for commercial wind energy development. The EIAR and Planning Statement fail to provide any convincing rationale as to why the considered conclusions of the adopted Development Plan and Wind Energy Strategy should now be disregarded.

The proposal therefore materially undermines:

- the integrity of the Development Plan;
- the environmental and landscape protections embedded within the Plan;
- the plan-led approach to renewable energy development; and
- public confidence in the statutory development plan process itself.

In circumstances where the Planning Authority has already undertaken a county-wide strategic assessment and expressly concluded that these lands are unsuitable for wind energy development due to environmental, landscape and settlement constraints, the burden on the applicant to robustly justify a departure from that strategy is particularly high. No such justification has been adequately provided within the application documentation.

7.1.2.2 Direct Conflict with the Tipperary County Development Plan 2022–2028 and Tipperary Renewable Energy Strategy 2016

The proposed development materially contravenes the adopted spatial strategy, Renewable Energy Strategy and environmental protection framework of the Tipperary County Development Plan 2022–2028 and the Tipperary Renewable Energy Strategy 2016 ("RES"). Crucially, the applicant expressly acknowledges within the Planning Statement that the proposed development site is located within lands designated as: "*Areas Unsuitable for New Wind Energy Development*"

This admission is highly significant. The designation did not arise arbitrarily, but instead followed a detailed county-wide strategic assessment process incorporating landscape, environmental, ecological and infrastructural constraints analysis. The applicant itself acknowledges that the RES:

has been informed by a LCA and SEA/HDA" and "identifies areas where wind energy development is 'open for consideration' and where wind energy developments are considered 'unsuitable'.

The applicant further acknowledges that the Strategy was prepared through:

... a step-by-step methodology comprising sieve mapping analysis of the key policy considerations. This process aims to balance environmental, landscape, technical and economic criteria in order to identify the most suitable locations in Tipperary for wind energy development.

Accordingly, the designation of the subject lands as unsuitable represents a deliberate, evidence-based and environmentally informed policy conclusion reached following Strategic Environmental Assessment, Appropriate Assessment, Landscape Character Assessment and county-wide constraints mapping.

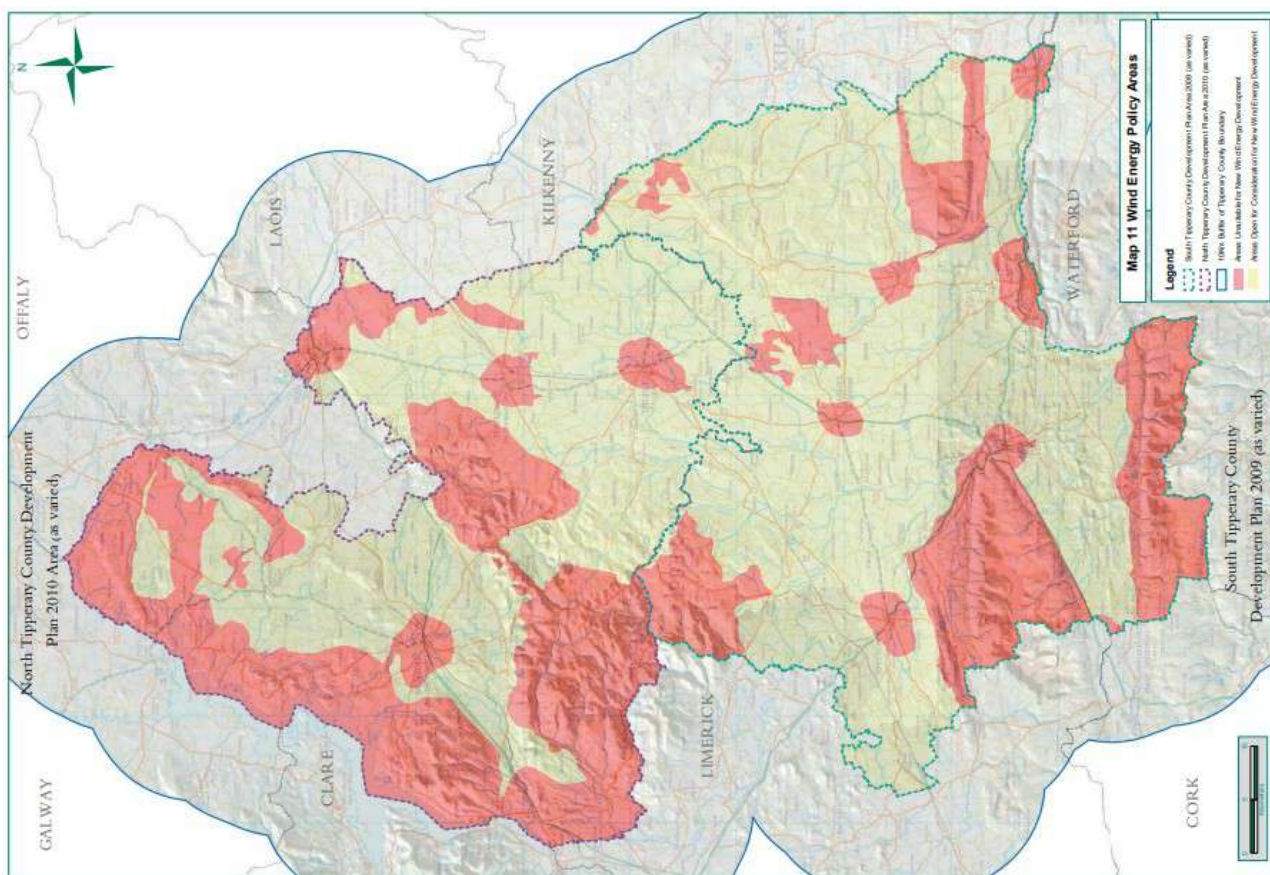


Fig. 12: Wind Energy Policy Areas extracted from the RES (Map No. 11) (Source: Ballincor Wind Farm Planning Statement / Tipperary RES)

Importantly, the Tipperary County Development Plan does not provide unconditional support for wind energy development. Rather, support is expressly contingent upon compliance with the Renewable Energy Strategy and the protection of environmental and landscape sensitivities. Section 10.4 of the Development Plan states:

The policies and objectives of the Renewable Energy Strategy (and any review thereof) will apply to proposals for renewable energy development in Tipperary...

The Development Plan further states that:

New development proposals will be subject to required environmental assessment processes where necessary, and balanced with the importance of maintaining and protecting the natural landscape.

Similarly, Policy 3-1 of the Development Plan seeks to:

Promote and facilitate renewable energy development, in accordance with the policies and objectives of the Tipperary Renewable Energy Strategy 2016 (and any review thereof)

The Renewable Energy Strategy itself is unequivocal regarding lands designated as unsuitable for new wind energy development. The Strategy states:

Areas 'Unsuitable for Further Development' – new wind energy development in these areas is not permitted. These areas have a special or unique landscape character where the main objective is conservation.

The RES further provides under Policy TWIND 4.13:

New wind energy projects will not normally be considered in these areas.

The only limited exceptions identified under Policy TWIND 4.14 relate to:

- repowering of existing wind farms;
- limited extensions to existing wind farms; or
- revised proposals within already permitted planning units.

subject to strict criteria including demonstration of no adverse impact on the receiving environment and, in many cases, no net increase in turbine numbers.

The proposed Ballincor Wind Farm does not constitute a repowering project, a minor extension to an existing operational wind farm, nor a revised proposal within an extant planning unit. Consequently, the proposal falls fundamentally outside the limited exceptions expressly contemplated by Policy TWIND 4.14.

The underlying rationale for the "unsuitable" designation is also critically important. The RES confirms that the county-wide policy mapping was informed by landscape sensitivity analysis, ecological constraints and cumulative impact considerations. Section 5.2 of the RES states:

... vulnerable', 'transitional vulnerable' and 'least compatible' areas are automatically considered unsuitable for new wind energy development.

The RES further confirms that:

The resulting Wind Energy Landscape Sensitivity Map has informed the Wind Energy Policy Areas Map.

In ecological terms, the RES identifies Natura 2000 sites, SPAs, SACs and NHAs as key policy considerations and notes that the Appropriate Assessment of the Strategy identified significant risks associated with wind energy development in sensitive areas. The RES specifically records that:

Wind Energy Development is unlikely to be compatible with the COs [Conservation Objectives] of the site and therefore avoidance is recommended

The RES additionally emphasises the need to manage cumulative impacts arising from wind turbine proliferation across the county. Section 6.3 states:

The Council is also mindful of the need to manage cumulative impact, and in this sense will limit development of wind turbines in certain areas over the lifetime of this Strategy.

Similarly, Policy TWIND 4.6 requires that:

All proposals for wind energy development will have regard to the cumulative effect of the development on the environment when considered in conjunction with other existing and permitted wind energy developments in the area.

The proposal therefore directly conflicts with:

- the spatial strategy of the Tipperary Renewable Energy Strategy 2016;
- Policy TWIND 4.13;
- the plan-led renewable energy framework adopted by Tipperary County Council;
- the landscape protection objectives of the Tipperary County Development Plan 2022–2028;
- the environmental protection strategy underpinning the SEA and AA processes; and
- the clear strategic objective of limiting further wind energy development within designated unsuitable areas due to landscape, ecological and cumulative impact concerns.

While the applicant attempts to justify the proposal by reference to national renewable energy and climate obligations, the Development Plan itself expressly recognises that renewable energy development must be balanced against environmental and landscape protection objectives. The existence of national climate targets does not negate or disapply the adopted statutory policy framework, particularly where the relevant Planning Authority has already undertaken a detailed county-wide evidence-based assessment identifying the subject lands as unsuitable for such development.

7.1.3 Failure of the Applicant to Meaningfully Address Why the Lands Were Deemed Unsuitable

A significant deficiency arising throughout the Planning Statement and EIAR documentation is the failure of the applicant to meaningfully engage with, or substantively address, the underlying rationale as to why the subject lands were strategically identified as unsuitable for new wind energy development under the Tipperary Renewable Energy Strategy and the Offaly Wind Energy Strategy. While the application documentation repeatedly acknowledges the existence of these statutory designations, the overall planning justification advanced by the applicant is overwhelmingly predicated upon broad national and European renewable energy policy support, climate obligations, energy security concerns and the legal availability of strategic infrastructure and material contravention mechanisms, rather than any robust rebuttal of the actual environmental, landscape and spatial planning concerns underpinning the "unsuitable" designation itself.

In this regard, the Planning Statement places extensive reliance upon:

- national climate policy and decarbonisation objectives;
- legally binding emissions reduction targets;
- EU Renewable Energy Directive obligations, including RED III;

- national energy security considerations;
- the Climate Action Plan;
- Section 37G of the Planning and Development Act; and
- wider Government policy support for renewable energy infrastructure.

However, there is comparatively little substantive engagement with the specific environmental, landscape and settlement-based constraints identified through the SEA-informed and AA-informed strategic assessment processes underpinning the respective Wind Energy Strategies. The effect of the applicant's approach is essentially to treat the unsuitable designation as a policy obstacle capable of being overridden by national climate policy, rather than as the outcome of a detailed evidence-based environmental and spatial planning exercise undertaken by the relevant planning authorities.

This represents a significant omission. The Tipperary Renewable Energy Strategy and Offaly Wind Energy Strategy were not prepared as abstract or aspirational guidance documents, but rather constitute integral components of the statutory development plan framework informed by strategic environmental assessment, landscape character assessment, appropriate assessment and county-wide constraints analysis. The Tipperary RES expressly confirms that the strategy was developed through:

... a step-by-step methodology comprising sieve mapping analysis of the key policy considerations. This process aims to balance environmental, landscape, technical and economic criteria in order to identify the most suitable locations in Tipperary for wind energy development.

Similarly, the applicant itself acknowledges that the RES:

... has been informed by a LCA and SEA/HDA

Accordingly, the designation of the subject lands as unsuitable reflects a deliberate strategic planning conclusion arising from the interaction of multiple environmental, landscape and settlement constraints rather than a generalised policy preference against wind energy development.

The Wind Energy Strategies themselves clearly identify the types of environmental and landscape sensitivities which informed the unsuitable designation. In the case of the Offaly Wind Energy Strategy, the Strategy expressly identifies:

- wetlands;
- designated bog lands;
- eskers;
- the River Shannon and associated callows;
- archaeological and historical landscapes;
- Areas of High Amenity;
- scenic routes;
- protected views;
- Natura 2000 sites; and
- landscape sensitivity areas,

as key constraints requiring protection or exclusion from wind energy development areas. The Strategy specifically states:

The wetlands, designated bog land areas, eskers, River Shannon and Callows and archaeological and historical landscapes are identified as being of high sensitivity...

The Strategy further confirms that:

High Landscape Sensitivity Areas have not been included in 'Areas Open for Consideration for Wind Energy Developments'...

Similarly, the Tipperary Renewable Energy Strategy expressly recognises the importance of landscape sensitivity and compatibility assessment in determining suitable areas for wind energy development. The RES states that:

'vulnerable', 'transitional vulnerable' and 'least compatible' areas are automatically considered unsuitable for new wind energy development.

The RES further confirms that:

The resulting Wind Energy Landscape Sensitivity Map has informed the Wind Energy Policy Areas Map.

Notwithstanding the foregoing, the Planning Statement fails to substantively interrogate why these identified sensitivities no longer warrant strategic protection in the context of the current proposal. Instead, the applicant largely proceeds on the basis that compliance with project-level EIAR and mitigation requirements is sufficient to overcome the adopted

unsuitable designation. This approach fundamentally misunderstands the purpose and role of the Wind Energy Strategies within the statutory planning framework.

The unsuitable designation does not merely indicate the presence of environmental effects capable of routine mitigation at project level. Rather, it reflects a strategic planning conclusion that the receiving environment lacks the capacity to accommodate large-scale wind energy infrastructure having regard to cumulative landscape change, settlement character, ecological sensitivity, visual absorption capacity, environmental protection objectives and the long-term spatial planning strategy for the area.

This distinction is critically important. The Wind Energy Strategies are expressly intended to operate as plan-led spatial frameworks directing wind energy development toward locations considered capable of accommodating such development while avoiding environmentally sensitive and visually vulnerable landscapes. In this regard, the Tipperary RES states:

This approach will ensure the protection of the environmental and landscape assets of the county from inappropriate development.

Similarly, the RES expressly recognises the importance of cumulative landscape management and strategic spatial control, stating:

The Council is also mindful of the need to manage cumulative impact, and in this sense will limit development of wind turbines in certain areas over the lifetime of this Strategy.

The applicant's documentation contains very limited meaningful engagement with these broader strategic objectives. While the EIAR addresses individual topic areas such as landscape, ecology, noise and cultural heritage in isolation, there is little substantive analysis of why the strategic planning conclusions reached through the adopted RES and Wind Energy Strategies should now be set aside. The Planning Statement effectively substitutes national climate policy support for any detailed rebuttal of the actual environmental and landscape rationale underpinning the unsuitable designation.

Furthermore, the applicant's reliance on national renewable energy policy and Section 37G override provisions does not negate the statutory status or planning significance of the Development Plans and associated Wind Energy Strategies. Importantly, neither national climate policy nor the strategic infrastructure provisions of the Planning and Development Act establish any presumption in favour of renewable energy development irrespective of environmental or landscape constraints. Rather, renewable energy development remains subject to the overarching requirement to ensure proper planning and sustainable development and to comply with statutory environmental obligations.

In circumstances where both Offaly County Council and Tipperary County Council have undertaken county-wide evidence-based strategic assessments and expressly concluded that the subject lands are unsuitable for new wind energy development, the burden on the applicant to robustly justify a departure from that strategic framework is particularly high. It is submitted that the Planning Statement and EIAR fail to discharge that burden in any meaningful or convincing manner.

7.1.4 Constraint-Led Nature of the Wind Energy Strategy

A notable feature of both the Offaly Wind Energy Strategy and the Tipperary Renewable Energy Strategy is that they adopt a fundamentally constraint-led and avoidance-based approach to wind energy development rather than a presumption in favour of development wherever a viable wind resource exists. The unsuitable designation applied to the subject lands arose following strategic county-wide assessment processes which specifically considered landscape sensitivity, ecological constraints, settlement patterns, designated sites and cumulative visual effects.

In this regard, the Offaly Wind Energy Strategy expressly identifies: "wetlands, designated bog land areas, eskers, River Shannon and Callows and archaeological and historical landscapes" as being of "high sensitivity", while the Tipperary RES confirms that:

... 'vulnerable', 'transitional vulnerable' and 'least compatible' areas are automatically considered unsuitable for new wind energy development.

The strategic designation of these lands as unsuitable therefore reflects a deliberate planning conclusion that certain landscapes and environmental receptors are incapable of accommodating large-scale wind energy development without unacceptable adverse effects. The applicant has failed to meaningfully demonstrate why the conclusions of these adopted evidence-based strategies should now be set aside in the context of the proposed development.

7.1.5 Conflict with Birr Environs Landscape and Environmental Sensitivities

In addition to the clear strategic policy conflict identified above, the proposed development would give rise to significant adverse effects on the wider landscape, environmental and visual setting of Birr and its environs. The proposed wind farm is not located within an isolated or visually contained upland landscape, but instead occupies a receiving environment intrinsically connected to the wider Birr area, including its scenic rural approaches, agricultural landscapes, heritage setting and the broader Little Brosna and callows landscape character.

The Offaly Wind Energy Strategy specifically identifies parts of the Birr environs and associated landscapes as constrained in the context of wind energy development, including reference to the Little Brosna Callows and associated environmental sensitivities. The Strategy notes the ecological importance of: *"The River Little Brosna Callows (SPA)... holding an assemblage of over 20,000 wintering waterbirds"*

The wider Birr receiving environment is characterised by a combination of scenic rural landscapes, ecological sensitivity, heritage features, demesne landscapes and established settlement character which collectively contribute to the area's visual and environmental quality. In this regard, the proposed development, by reason of its scale, turbine height, movement and extensive associated infrastructure, would introduce a highly industrial form of development into a sensitive and historically rural landscape setting.



Fig. 13: Proposed Turbine Layout in the Context of Birr and Surrounding Receiving Environment (Source: Applicant Drawings)

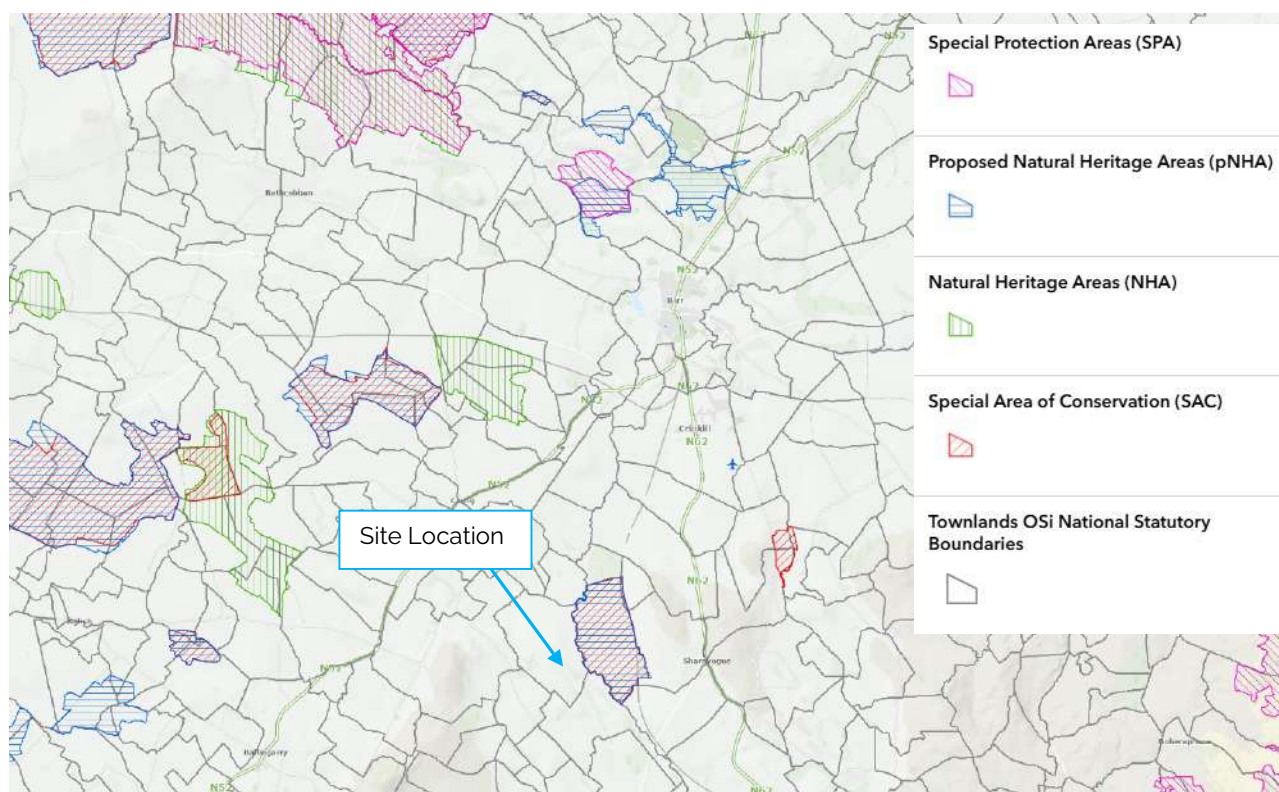


Fig. 14: Little Brosna and Associated Environmental Designations in the Vicinity of the Proposed Development (Source: NPWS Map Viewer)

The proposed grid connection and associated infrastructure further reinforce the interaction between the development and the wider Birr environs. The proposal cannot therefore be viewed as a standalone or isolated energy project detached from the surrounding landscape and settlement structure. Rather, the development would become a dominant and defining feature within the wider visual and environmental setting of Birr and its hinterland.

It is submitted that the proposed development would materially undermine the scenic quality, rural character and environmental sensitivities of the wider Birr receiving environment and would conflict with the strategic objective of the Wind Energy Strategies to protect sensitive landscapes and direct large-scale wind energy infrastructure away from environmentally constrained and visually vulnerable areas.

7.1.6 Ecological and Ornithological Sensitivity of the Receiving Environment

The receiving environment associated with the proposed development is characterised by significant ecological and ornithological sensitivities, particularly having regard to the proximity of the Little Brosna Callows SPA, Dovegrove Callows SPA and the wider network of wetland, callows and agricultural habitats which support important wintering and migratory bird populations. The ecological importance of the wider receiving environment is expressly acknowledged within the Offaly Wind Energy Strategy, which identifies: *"The River Little Brosna Callows (SPA)... holding an assemblage of over 20,000 wintering waterbirds"*

The Wind Energy Strategy further specifically references the Dovegrove Callows SPA and associated environmental constraints within the wider Birr environs. These are not incidental or localised ecological features, but rather form part of a strategically important ecological landscape recognised at both national and European level.

Importantly, the applicant's own Alternatives Assessment chapter effectively acknowledges the ecological sensitivity of the site and surrounding lands. The EIAR confirms that an earlier turbine layout was amended and that a turbine was removed specifically because: *"Turbine 1A... was removed... where whooper swans were noted to occasionally feed."* This admission is highly significant. The need to remove and reposition turbines during the design process due to identified ornithological sensitivities directly undermines any suggestion that the site is inherently suitable for large-scale wind energy development. Rather, the iterative redesign process itself demonstrates that the receiving environment contains sensitive ecological receptors requiring avoidance, buffering and mitigation.

The proposed development would introduce turbines of substantial scale and rotor sweep into a landscape characterised by open agricultural and wetland habitats utilised by wintering and feeding bird species. In such circumstances, the potential for habitat disturbance, displacement effects, collision risk and wider ecological fragmentation cannot be understated. The proposed development must also be considered in the context of cumulative ecological pressures and the acknowledged sensitivity of the wider callows landscape.

The ecological sensitivity of the receiving environment is further reinforced by the precautionary approach required under the Habitats Directive and Appropriate Assessment process. In this regard, the Offaly County Development Plan expressly states:

A project or plan may only proceed if it can be concluded on the basis of Appropriate Assessment that there will be no adverse effects on the integrity of a Natura 2000 site.

The Development Plan further emphasises the need for precaution:

If adverse effects are likely, or in cases of doubt ...

In circumstances where the applicant's own documentation identifies ornithological sensitivities requiring turbine removal and where the receiving environment forms part of a wider ecologically sensitive callows and wetland landscape supporting protected bird assemblages, it is submitted that considerable doubt remains regarding the capacity of the receiving environment to absorb the proposed development without adverse ecological effects. The proposed development therefore gives rise to serious concerns regarding ecological disturbance, habitat fragmentation and potential effects on the integrity of sensitive ecological receptors within the wider receiving environment.

7.1.7 Landscape Character, Visual Sensitivity and Areas of High Amenity

The proposed development would give rise to significant and permanent adverse effects on the landscape character, visual amenity and wider scenic quality of the receiving environment. The subject lands are located within a highly sensitive rural landscape characterised by open countryside, agricultural lands, wetland and callows landscapes, dispersed rural settlement patterns, heritage landscapes and important scenic and recreational amenities associated with the wider Birr environs and Little Brosna landscape. The sensitivity of this receiving environment is expressly acknowledged throughout both the Offaly Wind Energy Strategy and the Tipperary Renewable Energy Strategy.

The Offaly Wind Energy Strategy specifically recognises that:

The wetlands, designated bog land areas, eskers, River Shannon and Callows and archaeological and historical landscapes are identified as being of high sensitivity...

The Strategy further confirms that:

High Landscape Sensitivity Areas have not been included in 'Areas Open for Consideration for Wind Energy Developments'...

Similarly, the Strategy expressly acknowledges the visual sensitivity associated with wind energy development and the need to protect scenic and amenity landscapes, noting:

... having regard to the potential significant visual impact associated with windfarms ...

In this regard, the Wind Energy Strategies specifically identify Areas of High Amenity, scenic routes, protected views, sensitive landscape character areas and tourism/recreational landscapes as requiring protection from inappropriate development. These designations are of particular relevance in the context of the proposed development having regard to:

- the scale and height of the proposed turbines;
- the extent of turbine visibility across the wider receiving environment;
- the open and visually exposed nature of the surrounding landscape;
- the relationship with scenic rural approaches to Birr; and
- the interaction with the wider callows and wetland landscape character.

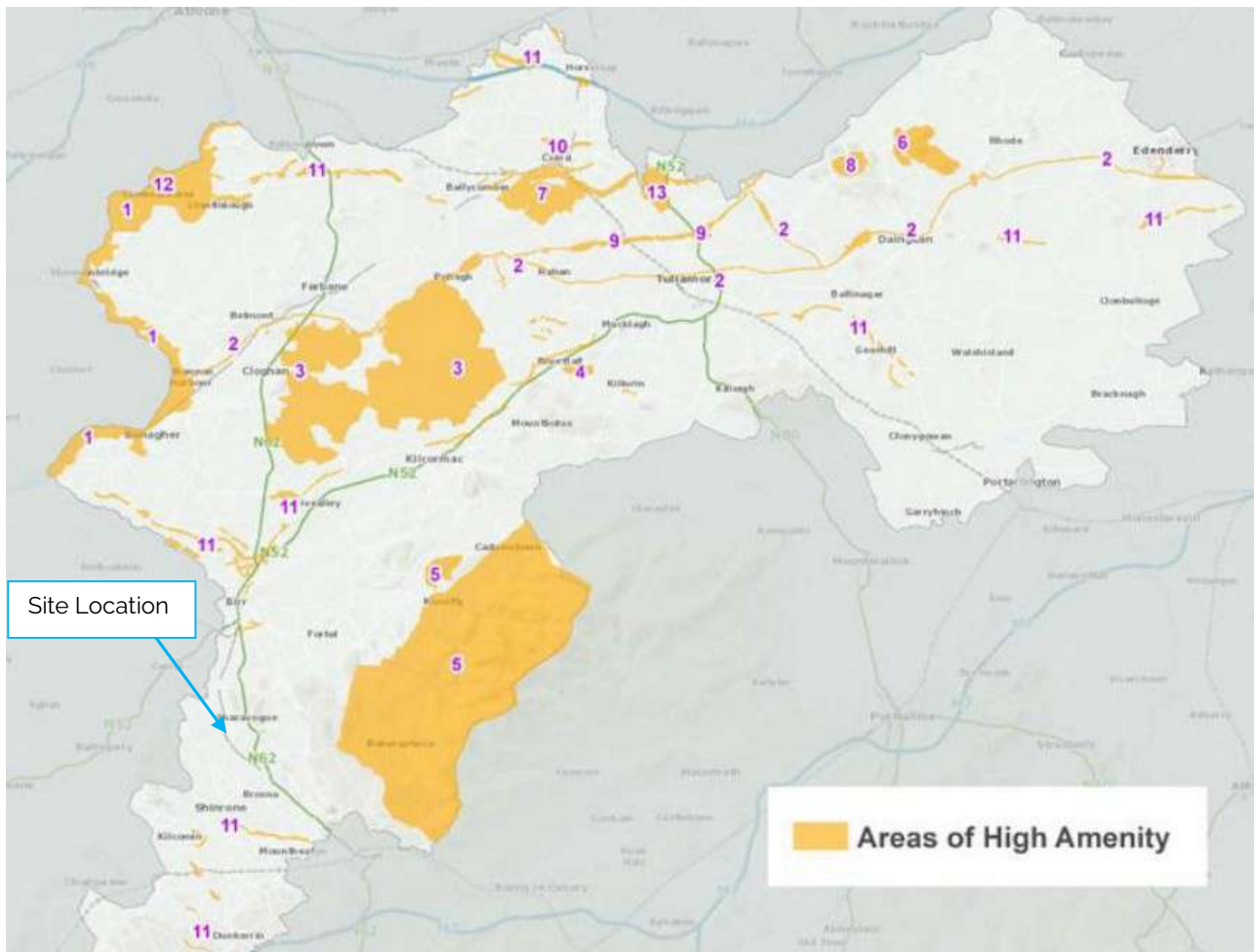


Fig. 15: Areas of High Amenity and Sensitive Landscape Designations in the Vicinity of the Proposed Development (Source: Offaly Wind Energy Strategy)

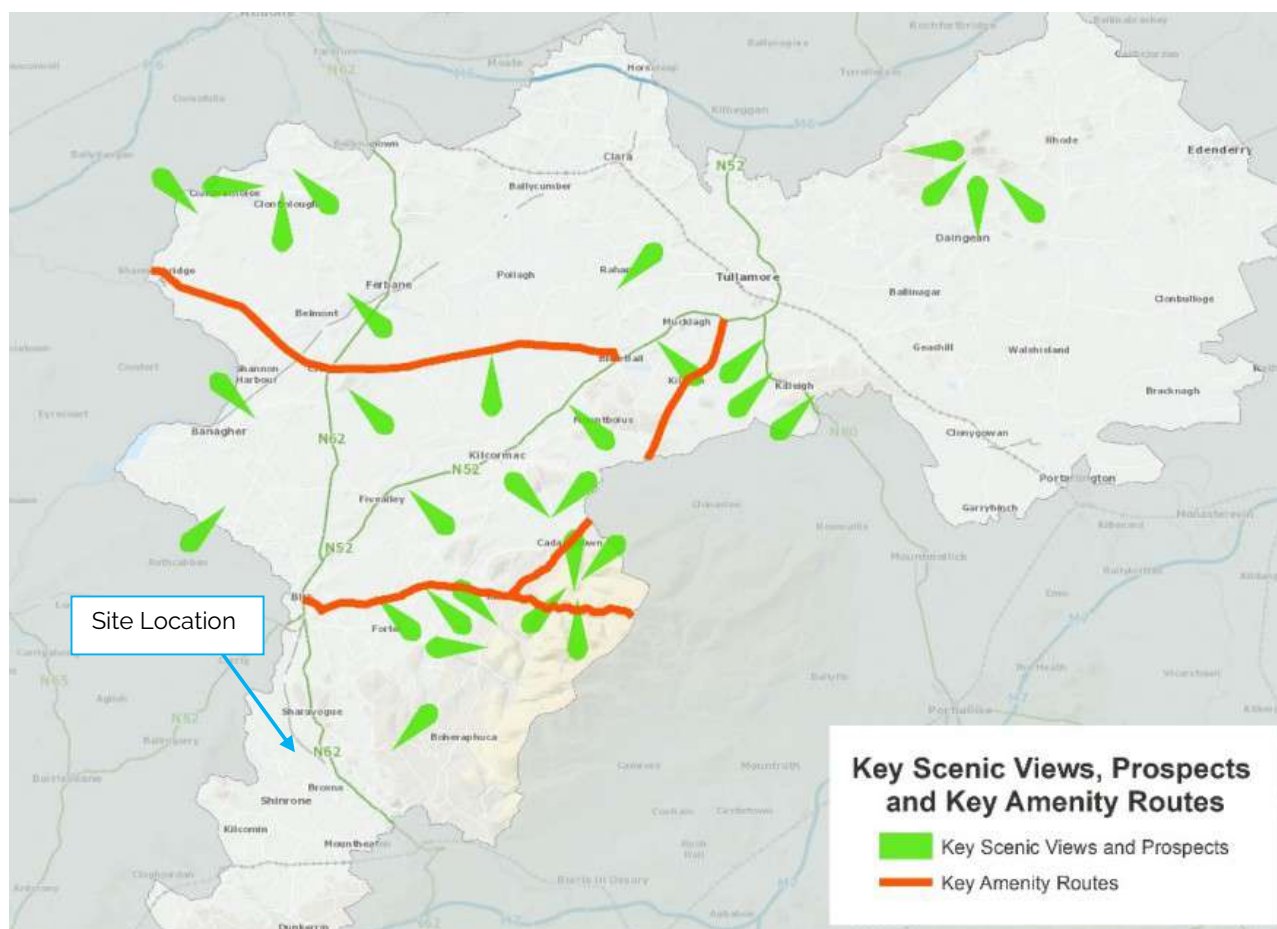


Fig. 16: Protected Views, Scenic Routes and Amenity Landscapes Relevant to the Proposed Development (Source: Offaly County Development Plan / EIAR)

Importantly, the applicant's own Alternatives Assessment chapter effectively acknowledges the significant visual and landscape constraints associated with the site. The EIAR confirms that the revised turbine layout was: *"greatly preferred to the initial layout due to reduced visual and landscape impact."* This admission is highly significant. The need for iterative redesign, turbine repositioning and visual impact reduction measures demonstrates that the receiving environment possesses a limited capacity to absorb large-scale wind energy development without significant adverse landscape and visual effects. The redesign process itself evidences the sensitivity of the receiving environment and undermines any suggestion that the site is inherently suitable for industrial-scale turbine development.

Notwithstanding the iterative design process, the revised layout continues to comprise turbines of substantial scale and vertical prominence extending across an open rural landscape. By reason of their height, movement, lighting and spatial extent, the proposed turbines would introduce a dominant industrialising influence into a landscape currently characterised by rural openness, ecological sensitivity and scenic quality. The proposed development would fundamentally alter the character of the receiving environment and would result in a significant transformation of the wider landscape setting.

The visual effects of the development must also be considered cumulatively in the context of the strategic objectives underpinning the Wind Energy Strategies. The purpose of the Areas of High Amenity designations, landscape sensitivity mapping and scenic route protections is not merely to avoid isolated visual effects at individual receptors, but to protect the broader character, identity and experiential quality of sensitive landscapes over the lifetime of the Development Plans and associated Wind Energy Strategies. In this regard, the Tipperary Renewable Energy Strategy expressly states:

The Council is also mindful of the need to manage cumulative impact, and in this sense will limit development of wind turbines in certain areas over the lifetime of this Strategy.

It is submitted that the proposed development would materially undermine these strategic landscape protection objectives and would result in an unacceptable industrialisation of a visually sensitive and environmentally constrained rural landscape.

7.1.8 Inherent Environmental Constraints Demonstrated by the Iterative Design Process

The iterative evolution of the proposed development throughout the site selection and design process further demonstrates the substantial environmental, landscape and technical constraints associated with the subject lands. The application documentation confirms that the proposed development underwent multiple revisions involving turbine removals, layout redesigns, revised infrastructure alignments, ecological buffers and additional mitigation measures in response to identified environmental sensitivities arising throughout the assessment process.

Importantly, these revisions were not undertaken merely as routine optimisation exercises, but rather arose directly from identified environmental, visual, ecological and heritage constraints associated with the receiving environment. The applicant's own Alternatives Assessment confirms that turbine layouts were revised due to:

- visual and landscape concerns;
- ornithological sensitivities;
- archaeology constraints;
- settlement and residential amenity considerations; and
- environmental limitations associated with the receiving environment.

In particular, the EIAR confirms that:

Turbine 1A... was removed... where whooper swans were noted to occasionally feed.

Similarly, the revised layout was stated to be:

... greatly preferred to the initial layout due to reduced visual and landscape impact.

The EIAR also acknowledges substantial archaeological sensitivities associated with the wider receiving environment and grid infrastructure, noting that:

A large number of archaeology notification zones occur...

The cumulative effect of these revisions is highly significant. Rather than demonstrating that the site is suitable for wind energy development, the iterative redesign process instead evidences the extent of the underlying constraints affecting the site from the outset. The need to:

- remove turbines;
- reposition infrastructure;
- introduce ecological stand-off distances;
- amend layouts;
- avoid ornithological receptors;
- reduce visual effects;
- navigate archaeological constraints; and
- implement additional mitigation measures,

collectively demonstrates that the receiving environment possesses limited capacity to accommodate industrial-scale wind energy infrastructure without giving rise to substantial adverse effects.

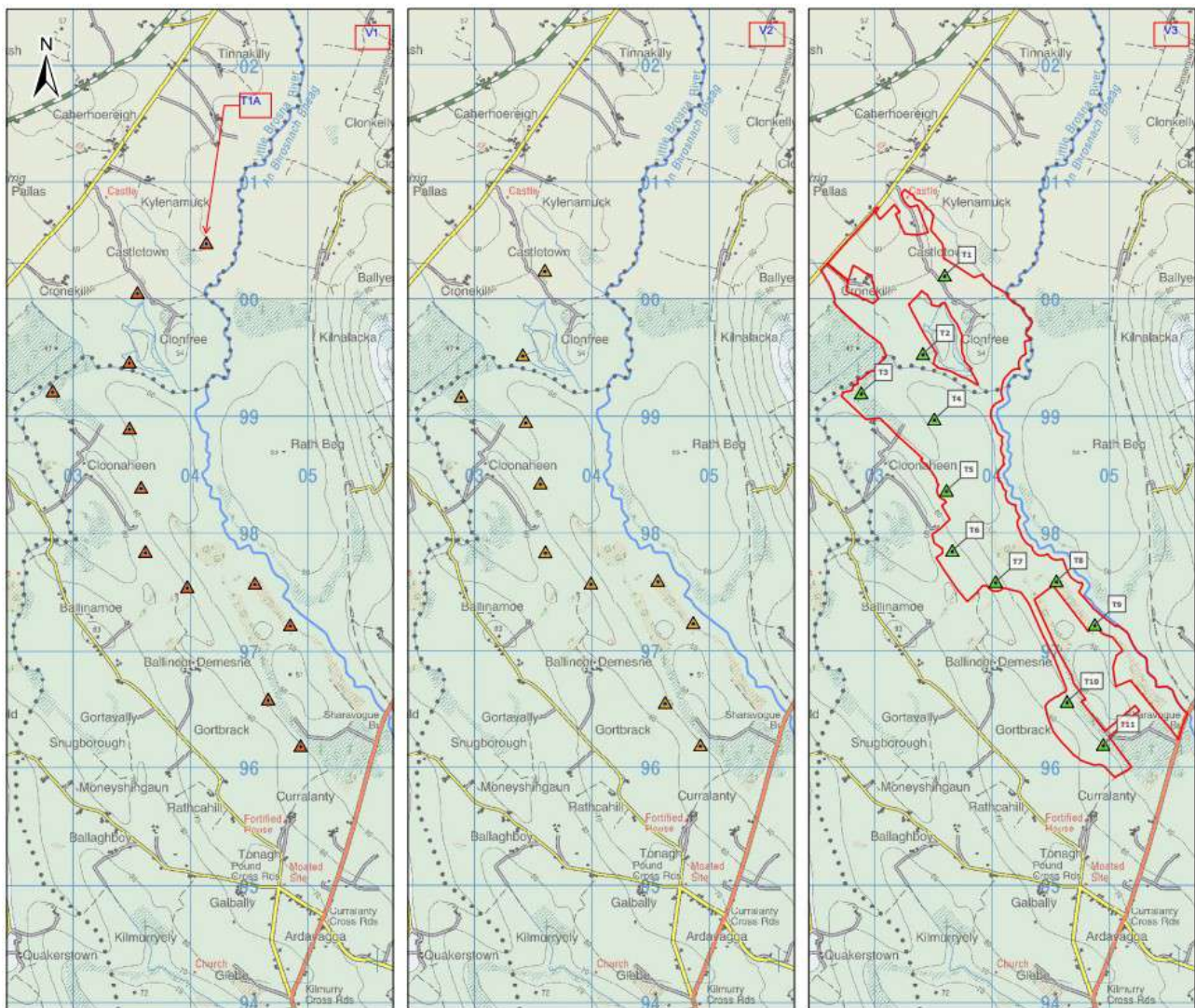


Fig. 17: Evolution of Turbine Layouts Throughout the Design Process (Source: EIAR / Alternatives Assessment)

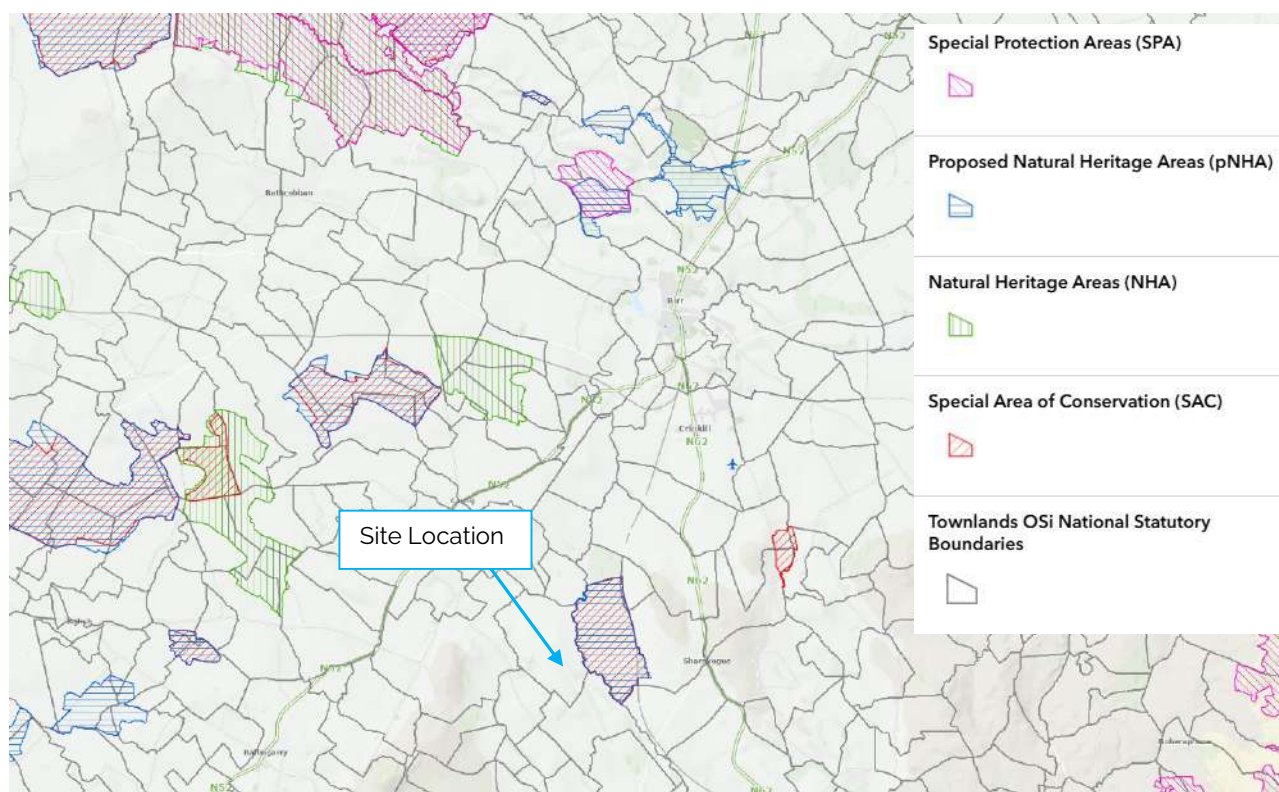


Fig. 18: Environmental and Technical Constraints Influencing Site Layout (Source: NPWS Map Viewer)

The redesign process further illustrates the interaction of multiple overlapping constraints within the receiving environment. The site is not characterised by isolated or singular environmental sensitivities, but rather by the cumulative interaction of:

- ecological and ornithological sensitivities associated with the wider callows landscape;
- visual and landscape sensitivity;
- archaeological and cultural heritage constraints;
- hydrological and wetland considerations;
- proximity to dwellings and dispersed rural settlement; and
- and broader cumulative environmental considerations.

In such circumstances, it is submitted that the application documentation itself effectively demonstrates that the subject lands are environmentally constrained and inherently sensitive to large-scale wind energy development. The repeated need for design amendments and mitigation-led revisions fundamentally undermines any suggestion that the site is naturally suited to accommodating industrial-scale wind turbines.

Indeed, the iterative nature of the design process reflects the reality that the proposed development is being advanced within a receiving environment already strategically identified by the relevant planning authorities as unsuitable for wind energy development due to environmental, landscape and settlement constraints. The redesign process therefore does not overcome the underlying strategic concerns identified through the Wind Energy Strategies, but rather reinforces and evidences them.

7.1.9 Alternatives Assessment Fails to Demonstrate Why This Unsuitable Site Was Selected

The Alternatives Assessment contained within the EIAR fails to provide any meaningful or convincing justification as to why the subject lands, which are expressly identified as unsuitable for wind energy development under both the Offaly and Tipperary statutory planning frameworks, were selected in preference to alternative and less constrained locations. While the applicant asserts that planning policy, environmental considerations and landscape constraints formed part of the site selection process, the outcome of that process was nonetheless the selection of lands specifically designated through SEA-informed and AA-informed strategic assessment as unsuitable for large-scale wind energy development. This represents a fundamental contradiction at the core of the applicant's site selection methodology.

The applicant states that the Tipperary Renewable Energy Strategy was prepared using:

... a step-by-step methodology comprising sieve mapping analysis of the key policy considerations

and further acknowledges that the RES sought:

to balance environmental, landscape, technical and economic criteria in order to identify the most suitable locations in Tipperary for wind energy development.

However, notwithstanding the existence of this adopted strategic planning framework identifying lands considered suitable and unsuitable for wind energy development, the applicant has failed to demonstrate why a site expressly identified as unsuitable was selected in preference to alternative locations considered capable of accommodating wind energy development within the relevant county strategies.

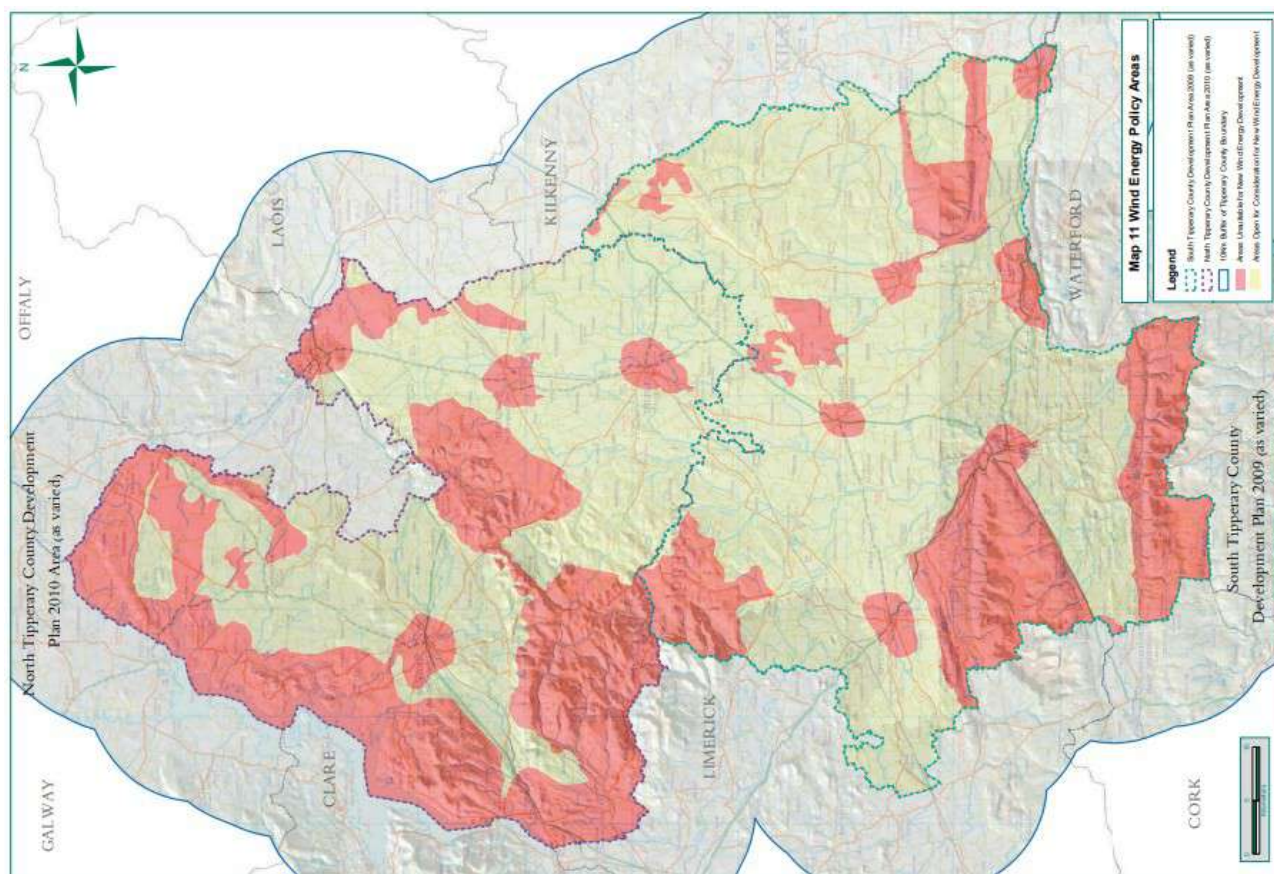


Fig. 19: Wind Energy Policy Areas Mapping identifying the Subject Lands within Areas Unsuitable for New Wind Energy Development (Source: Tipperary Renewable Energy Strategy / Applicant Planning Statement)

The Alternatives Assessment itself is heavily engineering-led and largely focused on internal refinement of the proposed development rather than any genuine comparative assessment of alternative suitable sites. The chapter primarily addresses:

- turbine repositioning;
- revised infrastructure alignments;
- grid connection options;
- turbine removals;
- visual mitigation measures; and
- engineering efficiencies,

rather than undertaking any robust examination of alternative locations capable of accommodating wind energy development with reduced environmental and landscape impact.

Indeed, the EIAR expressly confirms that:

This layout was greatly preferred to the initial layout due to reduced visual and landscape impact.

Similarly, the applicant confirms that:

Turbine 1A... was removed... where whooper swans were noted to occasionally feed.

These revisions demonstrate that the assessment process was fundamentally centred on attempting to mitigate the impacts of development within an environmentally constrained site, rather than questioning whether the site itself was appropriate in principle for industrial-scale wind energy development.

Furthermore, while the applicant references a broader national screening exercise, the EIAR does not contain any meaningful comparative assessment of alternative suitable lands identified within the Wind Energy Strategies themselves. Rather than demonstrating why the selected site represented the most appropriate location for development, the assessment instead appears premised upon a predetermined commitment to the subject lands with subsequent iterative attempts to reduce resulting impacts through mitigation and layout modification.

This is particularly significant in circumstances where both Offaly and Tipperary County Councils have already undertaken strategic county-wide assessments identifying lands considered capable of accommodating wind energy development and lands considered unsuitable due to environmental, landscape and settlement constraints. The applicant has failed to adequately explain why these adopted strategic planning conclusions should now be disregarded.

The outcome-led nature of the site selection process is further evidenced by the substantial degree of environmental and visual mitigation embedded throughout the iterative design process, including:

- turbine removal;
- visual impact reduction measures;
- ecological stand-off distances;
- avoidance buffers;
- revised layouts;
- infrastructure amendments; and
- cumulative impact mitigation.

Collectively, these revisions strongly suggest that the application process has been directed toward making a fundamentally constrained site “work” from an engineering and mitigation perspective, rather than objectively identifying the most appropriate and least environmentally sensitive location for development in the first instance.

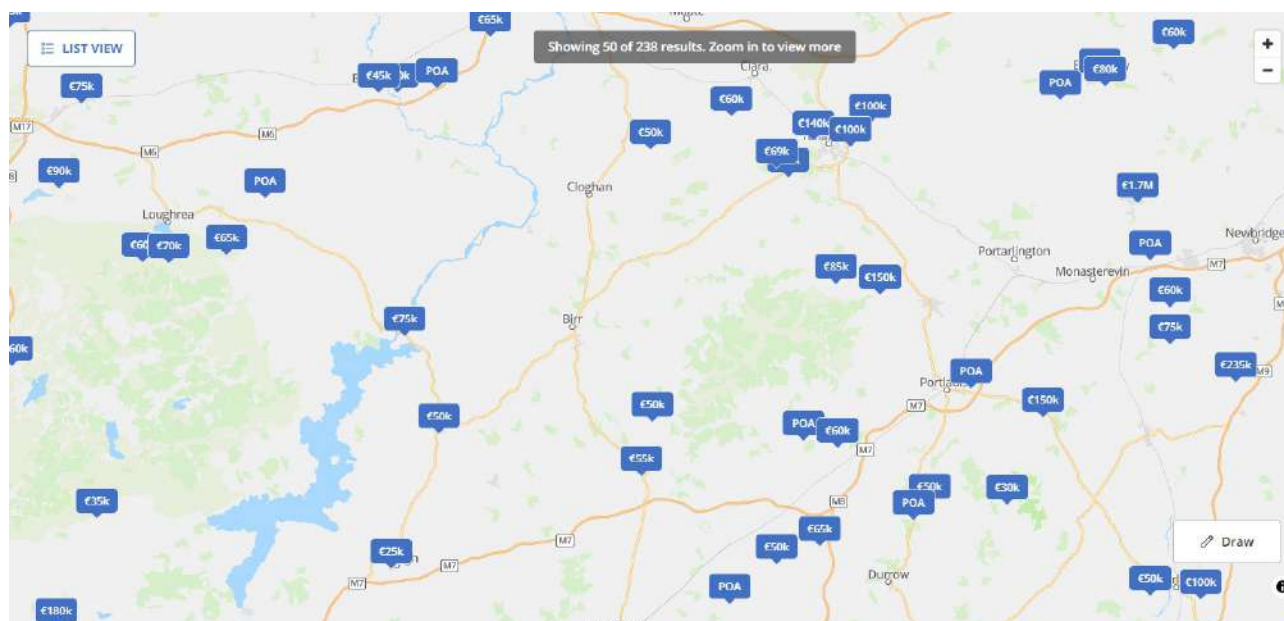


Fig. 20: Residential Property Listings within the Wider Birr Receiving Environment (Source: Daft.ie, accessed 19th May 2026)

This issue is further underscored by the established residential and rural amenity character of the wider receiving environment. A review of residential property listings within the wider Birr area on the date of writing (19th May 2026) demonstrates the extent of dispersed rural housing, residential occupation and ongoing residential activity throughout the surrounding landscape, reinforcing the sensitivity of the receiving environment and the importance of protecting residential amenity and rural landscape character.

In the circumstances, it is submitted that the Alternatives Assessment does not constitute a robust or objective evaluation of reasonable alternatives as required under the EIA Directive. Rather, the assessment appears structured around a predetermined commitment to the development of the subject lands notwithstanding their express designation as unsuitable for wind energy development under the adopted statutory planning framework.

7.1.10 Over-Reliance on National Renewable Energy Policy

The objection herein should not be interpreted as opposition to renewable energy development or the broader transition toward a low-carbon economy. It is fully acknowledged that renewable energy infrastructure will play a critical role in meeting national climate obligations, decarbonisation targets and energy security objectives at both national and European level. Equally, the relevant Development Plans expressly support renewable energy development in principle and recognise the importance of facilitating the transition toward sustainable energy generation.

However, the statutory planning framework is equally clear that renewable energy development must occur in a manner consistent with proper planning and sustainable development and must remain subject to environmental protection, landscape protection and statutory assessment requirements. National climate policy does not create an automatic entitlement to permission for renewable energy projects irrespective of environmental constraints, nor does it negate the statutory status and purpose of adopted Development Plans and Wind Energy Strategies. In this regard, the Offaly County Development Plan expressly states:

The Council is therefore required to achieve a reasonable balance between responding to overall positive Government policy on renewable energy and enabling the wind energy resources of the Planning Authority's area to be harnessed in a manner that is consistent with proper planning and sustainable development [emphasis added]

This wording is critically important. The Development Plan does not establish any presumption in favour of wind energy development irrespective of location or environmental sensitivity. Rather, it expressly recognises the need to balance renewable energy objectives with environmental protection, landscape sensitivity, residential amenity and the proper planning and sustainable development of the area.

Similarly, the Wind Energy Strategies themselves adopt a clear plan-led and environmentally constrained approach to renewable energy development. The Tipperary Renewable Energy Strategy expressly states that **"Areas 'Unsuitable for Further Development' – new wind energy development in these areas is not permitted."** while the Offaly Wind Energy Strategy confirms that areas identified as environmentally and visually sensitive were excluded from lands "Open for Consideration" following strategic assessment processes informed by SEA, AA and landscape sensitivity analysis. The statutory planning framework therefore expressly contemplates circumstances where environmental and landscape constraints outweigh the appropriateness of wind energy development within particular locations.

Notwithstanding this, the applicant's Planning Statement repeatedly relies upon broad national renewable energy policy, climate legislation, RED III obligations, energy security concerns and the legal availability of Section 37G strategic infrastructure provisions as primary justification for the proposed development. While such policy considerations are undoubtedly material, they cannot displace or render irrelevant the statutory planning framework or the identified environmental sensitivities underpinning the unsuitable land designation applying to the subject site.

Importantly, even the Supreme Court has expressly rejected the existence of any automatic or near-automatic presumption in favour of renewable energy development. As acknowledged within the applicant's own Planning Statement, the Supreme Court rejected *"a near-presumption of permission"* in the context of renewable energy infrastructure. This is highly significant. The legal position remains that renewable energy projects must be assessed on their individual merits having regard to the proper planning and sustainable development of the area and compliance with statutory environmental obligations.

In circumstances where **both Offaly County Council and Tipperary County Council have undertaken strategic county-wide evidence-based assessments and expressly concluded that the subject lands are unsuitable for large-scale wind energy development due to environmental, landscape and settlement constraints, the applicant cannot simply rely upon generalised national climate policy as a basis for disregarding those adopted planning conclusions. To permit such an approach would fundamentally undermine the integrity of the plan-led planning system and the purpose of the Wind Energy Strategies themselves.**

Ultimately, while national renewable energy policy constitutes an important material consideration, it cannot justify development within environmentally unsuitable and strategically constrained locations absent compelling and site-specific justification demonstrating why the identified environmental, landscape, ecological and settlement concerns no longer apply. It is submitted that no such robust justification has been provided in the present case.

7.2 Ground 2: Incomplete and Uncertain Project Design – Over-Reliance on Design Flexibility, Worst-Case Parameters and Post-Consent Refinement

The application is characterised by a material degree of design flexibility and post-consent uncertainty, particularly in relation to the final turbine model, rotor diameter, hub height, export capacity, operational characteristics and associated control systems. While the GBWAG acknowledges that An Coimisiún Pleanála issued an Opinion on Design Flexibility in respect of specified turbine parameters, such flexibility does not relieve the applicant of the obligation to ensure that the proposed development is described with sufficient precision and that the likely significant effects of the project are fully identified, assessed and disclosed prior to the grant of development consent.

The proposed development is not a small or conventional project where minor design flexibility would have limited environmental consequence. Rather, it comprises an extensive industrial-scale wind energy development including 11 no. wind turbines, a 110kV on-site substation, Battery Energy Storage System, internal access roads, turbine foundations and hardstanding areas, borrow pits, construction compounds, underground cabling, a 12.23km grid connection route, turbine delivery accommodation works, watercourse crossings, drainage infrastructure, peat and spoil management, forestry felling, hedgerow removal and ancillary works. Chapter 2 of the EIAR confirms that the proposed turbines would have a blade tip height of between 179.5m and 180m, rotor diameter of between 149m and 163m, and hub height of between 98.5m and 105m. It further confirms that the exact turbine make and model will be dictated by a competitive tender process and will not be finally selected until turbine selection stage / pre-construction.

The GBWAG does not contend that reasonable design flexibility is incapable of being accommodated within the planning and EIA process. However, the flexibility permitted must remain clearly defined, environmentally bounded and capable of meaningful public assessment. In this case, the final turbine specification is central to several of the most important environmental effects arising from the proposed development, including landscape and visual impact, shadow flicker, operational noise, aviation lighting, ornithological collision risk, turbine curtailment, turbine delivery requirements, foundation design, construction methodology and residential amenity. The final turbine model is therefore not a minor procurement detail, but a core element of the project which materially influences the scale, character and likely effects of the development.

The applicant seeks to address this uncertainty by relying upon an asserted “*design envelope*” and “*worst-case*” assessment methodology. However, a worst-case approach is only adequate where the assessment clearly demonstrates that the selected parameters genuinely represent the worst-case position for each environmental topic. That is not a straightforward exercise in the context of wind energy development. The largest rotor diameter may represent the worst-case scenario for shadow flicker and swept area, whereas the tallest hub height may be more relevant to visual exposure, turbine visibility, aviation lighting and landscape perception. A particular turbine model may have different sound power levels, rotational speeds, curtailment characteristics, blade design, nacelle dimensions and foundation requirements. Accordingly, it cannot simply be assumed that one turbine option represents the worst case for all environmental topics.

This concern is reinforced by Table 2-2 of the EIAR, which identifies three potential turbine options: N149, N163 and V150. These options have different combinations of tip height, rotor diameter and hub height. The N163 option, for example, has a 163m rotor diameter and 98.5m hub height, while the N149 and V150 options have smaller rotor diameters but 105m hub heights. The environmental implications of these differences are not uniform. A lower hub height with a larger rotor may have different shadow flicker, noise, visual and ornithological implications from a taller hub height with a smaller rotor. The Commission must therefore be satisfied that the EIAR has not merely assessed a range of plausible turbine sizes but has robustly assessed the true worst-case scenario for each environmental receptor and discipline.

Table 2-2 Proposed WTG Design Flexibility Parameters

Proposed Turbine Parameters		N149	N163	V150
Turbine				
Tip Height		179.5m	180m	180m
Rotor Diameter	149-163m	149m	163m	150m
Hub Height	98.5-105m	105m	98.5m	105m
Colour	White/Light Grey	White/Light Grey	White/Light Grey	White/Light Grey
Number of Blades	Three	Three	Three	Three
Tower Type	Tubular tower with horizontal axis	Tubular tower with horizontal axis	Tubular tower with horizontal axis	Tubular tower with horizontal axis
Turbine Foundations				
Diameter	24-26m	24	26	26
Volume of Concrete Required	650-700m ³	650-700 m ³	650-700 m ³	650-700 m ³
Turbine Hardstands				
Turbine Hardstands	*	75m length and 40m width	75m length and 40m width	75m length and 40m width

*excluding assist crane pads and boom assembly hardstands – approximately 75m length to be added to include these. See Drawing 11333-2031 for further information.

Fig. 21: Proposed WTG Design Flexibility Parameters (Source: Table 2-2, Chapter 2 of the EIAR)

The applicant's own wording confirms that the final turbine selection remains unresolved. Chapter 2 states that *"the exact make and model of the turbine will be dictated by a competitive tender process"* and that the exact combination of rotor diameter and hub height will be dictated by the final selection of the turbine make and model at turbine selection stage / pre-construction. It further states that new turbine models or variants may become available due to technological advances which were not on the market at the pre-planning / EIA stage, but which may fit within the assessed parameters. **This demonstrates that the application is not for a fixed turbine model but for a development envelope within which the applicant seeks to retain commercial and technological flexibility.**

The Design Flexibility Opinion issued by An Coimisiún Pleanála must also be understood in its proper context. The Opinion identifies the relevant flexible details as turbine dimensions, namely turbine tip height, rotor diameter and hub height, and refers to flexibility for export capacity. It identifies the stated circumstances for such flexibility as including ongoing advances in technology, procurement flexibility and avoiding potential obsolescence of existing technology. However, the Opinion does not constitute a determination that the EIAR is adequate, nor does it remove the obligation to assess the likely significant effects of the final project. The Opinion facilitates the making of an application containing design flexibility; it does not predetermine the planning acceptability of that flexibility or the sufficiency of the environmental assessment.

The issue is particularly significant because the project also contains a number of other elements which remain subject to further detail, later approval, separate consent, or future confirmation. Chapter 2 confirms that works required within the public road corridor to accommodate the turbine delivery route are identified and assessed in the EIAR, but permission for those works will be sought separately. It also states that a further consenting process will be used to obtain permission for other temporary works areas along the turbine delivery route within the public road corridor. This includes works such as temporary removal of signage, lighting columns, bollards, vegetation clearance, safety barrier alterations and temporary load-bearing surfaces. These works are integral to the physical delivery of the turbines to the site and therefore form part of the overall project for environmental assessment purposes.

In addition, Chapter 2 confirms that the local electricity supply connection will be designed and constructed by ESB Networks, and that details regarding the exact location of poles and the connection route will need to be determined prior to construction. The Traffic Management Plan is also described as a living document which will be finalised following the appointment of the main construction contractor. The CEMP is similarly stated to be capable of being updated prior to commencement of development to address planning conditions and additional mitigation. The wastewater storage tank alarm details and final wastewater destination are also to be submitted at a later stage once the relevant arrangements are known. These matters may be capable of being dealt with by condition in appropriate circumstances, but they collectively demonstrate a significant reliance on post-consent refinement across important aspects of the project.

The proposed Battery Energy Storage System further illustrates the need for design certainty. Chapter 2 confirms that the BESS will comprise 90 no. battery containers, 17 no. power conversion system units, a BESS control building, CCTV, car parking, underground cable connections, landscaping and associated works. It states that the containers are self-contained, that a fire risk assessment is included in Appendix 2-7, and that the BESS system will have an inert gas fire suppression system. However, given the scale of the BESS compound and its integration with the wider wind farm and substation infrastructure, the final design, safety systems, emergency response arrangements and operational controls should be fully transparent and capable of public assessment at application stage. They should not be treated as ancillary matters divorced from the wider uncertainty created by the flexible turbine envelope and post-consent refinement of operational systems.

The GBWAG is particularly concerned that this design flexibility interacts with topics where the applicant's assessment relies heavily on operational mitigation and future control mechanisms. For example, the shadow flicker assessment depends upon final turbine specifications, receptor co-ordinates, turbine control software, real-time sensors and shutdown programming. The noise assessment depends upon turbine sound power data, hub height, operating characteristics, curtailment and compliance modelling. Ornithological assessment is influenced by rotor diameter, swept area, hub height and turbine operation. Landscape and visual effects are influenced by turbine height, blade length, rotor diameter, lighting and final turbine appearance. In such circumstances, final turbine choice is not a neutral or purely commercial matter.

The public participation concern is also material. Affected residents, landowners, prescribed bodies and observers are entitled to understand the development for which permission is sought and to assess its likely effects on their homes, lands, local roads, environmental receptors and communities. Where the application is framed around a flexible turbine envelope, future turbine procurement, later design confirmation, updated pre-construction models, living management plans and separate consenting processes for associated works, the public is required to comment on a project whose final operational and construction characteristics are not fully fixed. This is particularly problematic in circumstances where the proposed site is already located within lands identified as unsuitable for wind energy development under both the Offaly and Tipperary Wind Energy Strategies.

The EIA process requires likely significant effects to be identified, described and assessed before development consent is granted. It is not sufficient to leave material assessment matters to future modelling, future contractor design, future turbine selection, future agreement with public authorities or future operational adjustment. Mitigation measures must be sufficiently specific, enforceable and capable of implementation. The Commission must be satisfied at consent stage that the final development ultimately constructed will remain entirely within the assessed environmental envelope and will not give rise to materially different or greater effects than those assessed in the EIAR.

This concern is heightened by the scale and duration of the development. The applicant seeks a 10-year permission, a 35-year operational life from commissioning and permanent permission for the grid connection route and substation. The environmental effects of the project will therefore endure over a very substantial period. It is not acceptable for key elements of the design, mitigation and implementation strategy to remain uncertain where those elements bear directly on long-term effects on residential amenity, landscape character, ecology, hydrology, traffic, safety and environmental protection.

The GBWAG therefore submits that the application is premature and deficient insofar as it relies upon a combination of design flexibility, worst-case assumptions, future turbine selection, post-consent refinement, living management plans and separate consenting processes without providing sufficient certainty that the likely significant effects of the final project have been robustly assessed. The Design Flexibility Opinion permits the application to proceed with specified flexibility; it does not cure any resulting evidential or assessment deficiency.

Should the Commission be minded to grant permission, it is respectfully submitted that any permission must include strict and enforceable conditions requiring the final turbine model, hub height, rotor diameter, blade length, sound power data, rotational speed, aviation lighting details, shadow flicker model, noise curtailment strategy, turbine shutdown protocol, BESS safety details, final construction methodology, final traffic management plan and all relevant updated environmental compliance documents to be submitted for written approval prior to commencement. Such submissions should be independently verified and should expressly demonstrate that the final selected turbine and associated infrastructure will not give rise to any greater or materially different environmental effects than those assessed in the EIAR.

In the absence of such certainty and safeguards, the Commission cannot be satisfied that the EIAR provides a complete, reliable and legally robust basis for informed decision-making.

7.3 Ground 3: Noise and Vibration Impacts – Methodological Deficiencies, Underestimation of Effects and Failure to Demonstrate Compliance

The assessment of noise impacts associated with the proposed development contains a number of significant methodological deficiencies which collectively call into question the reliability of the conclusions reached regarding compliance with applicable noise limits and the protection of residential amenity. While each individual assumption or modelling choice adopted by the applicant may appear reasonable when considered in isolation, the cumulative effect of these assumptions, together with identified omissions and areas of uncertainty, has the potential to materially influence the predicted noise environment. Of particular concern are issues relating to the selection of modelling parameters, the treatment of cumulative noise effects, the absence of assessment of valley propagation effects, the reliance on extrapolated background noise data at higher wind speeds and the failure to clearly demonstrate compliance with relevant Development Plan requirements. It is submitted that these deficiencies result in a significant risk that operational noise impacts have been underestimated and that the Commission cannot be satisfied that residential amenity will be adequately protected throughout the operational life of the development.

7.3.1 Systematic Selection of Assessment Inputs Producing the Lowest Predicted Noise Levels

The GBWAG does not contend that any single modelling assumption adopted within the EIAR is, in isolation, necessarily inconsistent with accepted acoustic assessment practice. Rather, concern arises from the cumulative effect of a series of modelling choices and assessment parameters which, when taken together, consistently operate to reduce predicted noise levels and maximise the available compliance margin. In circumstances where the Commission is being asked to rely upon the assessment to conclude that the proposed development will not give rise to significant adverse effects on residential amenity, it is essential that the assessment adopts a precautionary and robust approach which appropriately accounts for uncertainty and potential variability in real-world operating conditions.

The EIAR states that operational noise has been assessed in accordance with the guidance contained within the 2006 Wind Energy Development Guidelines and the 2019 Draft Revised Wind Energy Development Guidelines. The assessment subsequently concludes that all non-involved residential properties can comply with the applicable daytime and night-time noise limits. However, a review of the methodology adopted indicates that a number of key assessment inputs have been selected at the lower end of the range of available assumptions, including:

- Adoption of the fixed 40 dB(A) daytime threshold at numerous receptors;
- Application of a ground absorption coefficient of $G = 0.5$;
- Assessment of receptor locations at a height of 4 metres above ground level;
- Reliance upon background noise surveys undertaken during the summer period only;
- Relatively limited compliance margins at a number of receptors, particularly those located in closer proximity to the proposed turbines.

While each of these assumptions may individually be capable of justification, the concern is that they have not been balanced by corresponding conservative assumptions elsewhere within the assessment. Instead, the cumulative effect is a modelling exercise which consistently trends towards lower predicted operational noise levels and reduced predicted effects.

Particular concern arises where available compliance margins are already relatively limited. Appendix 11.6 demonstrates that a number of Noise Sensitive Locations ("NSLs") are predicted to operate within only a small margin of the applicable noise limits. For example, NSL H060 records a predicted night-time exceedance of +2.3 dB and +2.5 dB at higher wind speeds prior to the application of curtailment measures, while NSLs H071, H081 and H100 similarly approach or exceed applicable criteria under certain wind speed conditions. Such results demonstrate that compliance is dependent upon a relatively narrow margin and, in certain instances, operational mitigation measures.

The existence of these limited margins is significant. Acoustic prediction models are inherently subject to uncertainty arising from topographical influences, meteorological variability, turbine operational characteristics, background noise fluctuations and modelling assumptions. Consequently, where a project demonstrates substantial compliance headroom, minor variations in assumptions may have little practical consequence. Conversely, where compliance margins are reduced to only a few decibels, relatively small adjustments to modelling inputs may materially alter the outcome of the assessment.

In this regard, it is noteworthy that the EIAR does not provide a comprehensive sensitivity analysis demonstrating the effect of alternative reasonable modelling assumptions on predicted receptor noise levels. The Commission is therefore not presented with an assessment of how predicted noise levels would vary under different ground absorption conditions, alternative receptor heights, differing seasonal background noise environments or other plausible assessment scenarios. The absence of such sensitivity testing makes it difficult to determine the degree to which the conclusions reached are dependent upon the particular assumptions selected.

The GBWAG respectfully submits that the issue is not whether any individual assumption can be defended in isolation. Rather, the concern is that the assessment has consistently adopted assumptions which collectively minimise predicted operational noise levels and maximise apparent compliance with the applicable limits. When combined with the limited compliance margins identified at a number of receptors, this approach materially reduces the tolerance available for modelling uncertainty, omitted corrections and real-world operational variability. As such, the Commission cannot be satisfied that the predicted noise environment represents a robust worst-case assessment of the likely operational impacts of the proposed development.

This issue is considered further in the following sections, which examine specific methodological deficiencies including the treatment of valley propagation effects, background noise extrapolation at higher wind speeds, and the assessment of cumulative operational noise.

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

A further significant concern arises in relation to the apparent failure of the applicant to assess potential valley propagation effects in accordance with recognised industry guidance. While the EIAR repeatedly states that the assessment has been undertaken in accordance with the Institute of Acoustics Good Practice Guide ("IoA GPG"), a detailed review of Chapter 11 and the supporting appendices indicates that no assessment has been undertaken of the specific topographical circumstances which may give rise to enhanced sound propagation across concave ground profiles and valley landforms.

The applicant states that:

The guidance contained within IOA GPG is considered to represent best practice and has been adopted in this assessment.

Similarly, Appendix 11.4 confirms that the noise predictions were undertaken in accordance with the IoA GPG and ISO 9613-2 and that topographical data was incorporated within the modelling process.

However, notwithstanding these statements, there is no evidence within Chapter 11 or Appendix 11.4 that the applicant has considered the requirements of Section 4.3.9 of the IoA Good Practice Guide relating to sound propagation across concave terrain profiles. This guidance recognises that under certain topographical conditions, including valley-type landforms where the ground profile falls away between source and receptor before rising again, sound propagation may be enhanced beyond that predicted by standard modelling assumptions.

The significance of this issue is particularly relevant having regard to the topography of the receiving environment. The proposed development is located within a landscape characterised by undulating terrain, river corridors, callows landscapes and localised valley features associated with the wider Little Brosna catchment. In such circumstances, the potential influence of terrain-induced propagation effects warrants explicit consideration and assessment.

Notwithstanding the apparent relevance of this issue, the EIAR contains no identifiable assessment of valley propagation effects, no receptor-specific topographical review, no presentation of receptor elevation data and no explanation as to why the provisions of Section 4.3.9 of the IoA GPG were considered inapplicable. While Appendix 11.4 confirms that OSI topographical data was utilised within the modelling process, the documentation does not demonstrate whether the additional assessment procedures recommended under the IoA GPG for concave terrain situations were undertaken.

This omission is particularly significant given the relatively limited compliance margins identified at a number of Noise Sensitive Locations throughout the assessment. As demonstrated in Appendix 11.6, certain receptors are already predicted to operate close to the applicable noise limits, while others require operational curtailment measures to achieve

compliance. Consequently, even relatively modest increases in predicted noise levels arising from terrain-related propagation effects could have a material influence on the conclusions of the assessment.

The GBWAG does not seek to definitively quantify the effect of any omitted valley correction. However, a preliminary independent review undertaken by members of the local community using the applicant's published noise data indicates that application of the valley propagation methodology has the potential to materially alter the compliance conclusions presented within the EIAR. In particular, that review suggests that a number of receptors currently predicted to comply with the applicable night-time criteria may experience substantially reduced compliance margins, and potentially exceedances, where enhanced propagation effects are taken into account.

The Commission is therefore faced with a situation where the applicant asserts compliance with recognised best-practice guidance, yet the submitted assessment contains no transparent evaluation of a potentially relevant aspect of that guidance and no justification for its omission. In the absence of such analysis, it cannot be concluded with confidence that the operational noise predictions presented within the EIAR represent a robust assessment of the likely noise environment experienced at nearby residential properties.

7.3.3 Inadequate Assessment of High Wind Speed Conditions

A further significant concern arises regarding the robustness of the background noise dataset utilised within the assessment, particularly at higher wind speeds where the proposed turbines are predicted to generate their greatest noise emissions. While the applicant undertook background noise monitoring at a number of representative locations, the monitoring programme was undertaken over a relatively limited period between July and September 2022. Consequently, the dataset is derived exclusively from summer conditions and does not incorporate autumn or winter monitoring periods when higher and more sustained wind speeds are typically experienced.

The assessment methodology relies upon establishing a relationship between measured background noise levels and wind speed in accordance with recognised guidance. This relationship subsequently forms the basis for determining applicable noise limits and assessing operational compliance. However, a review of the supporting noise appendices indicates that the quantity of measured data available at higher wind speeds is significantly reduced when compared to lower wind speed ranges. In a number of instances, there are very limited measured data points above 7m/s, with some higher wind speed categories appearing to rely substantially upon extrapolated rather than directly measured values.

This issue is particularly important because the higher wind speed bands represent the operating conditions under which the proposed turbines are expected to generate their highest sound power levels. The applicant's assessment demonstrates that turbine noise emissions generally increase with wind speed before reaching rated operational output. Consequently, the reliability of the background noise dataset is of greatest importance precisely within the wind speed range where operational noise impacts are likely to be most pronounced and where available compliance margins become increasingly constrained.

The concern is therefore not merely the absence of additional monitoring data, but the interaction between limited measured data availability and the compliance methodology adopted. At higher wind speeds, the assessment increasingly relies upon regression-derived and extrapolated background noise values to establish applicable limits. As a result, relatively small changes in the underlying regression relationship may materially influence the compliance outcome presented for individual receptors.

Furthermore, the use of a summer-only survey period raises legitimate questions regarding whether the monitoring programme adequately captures the full range of meteorological conditions likely to occur throughout the operational life of the development. Seasonal variations in wind characteristics, vegetation cover, agricultural activity and ambient environmental noise conditions may influence background noise behaviour in a manner not fully reflected within the survey dataset. Notwithstanding this, no supplementary autumn or winter monitoring programme appears to have been undertaken to verify the validity of the adopted regression relationships at higher wind speeds.

This issue is particularly significant when considered alongside the relatively limited compliance margins identified at a number of receptors and the reliance on operational mitigation measures at certain locations. Where compliance conclusions depend upon narrow margins, confidence in the underlying background noise dataset becomes critically important. In such circumstances, the Commission must be satisfied not only that the adopted methodology is technically acceptable, but also that the underlying dataset is sufficiently robust to support the conclusions reached.

It is therefore submitted that the assessment does not adequately demonstrate the reliability of the background noise model at higher wind speeds and that undue reliance has been placed upon extrapolated data within the wind speed range most relevant to operational turbine noise emissions. This introduces a material degree of uncertainty into the assessment and further undermines confidence in the conclusion that residential amenity will be adequately protected under all operating conditions.

7.3.4 Reliability of the BG+5 Assessment Regime

A further area of concern relates to the application of the background noise plus 5 dB ("BG+5") assessment regime and the extent to which the resulting compliance conclusions are dependent upon extrapolated background noise data at higher wind speeds. While the BG+5 methodology is established within ETSU-R-97 and the Wind Energy Development

Guidelines, its reliability is inherently dependent upon the robustness and representativeness of the underlying background noise dataset from which the regression curves are derived.

As outlined in the preceding section, the background noise survey was undertaken during a limited summer monitoring period and contains relatively few measured data points at higher wind speeds. Notwithstanding this limitation, the assessment transitions from the fixed lower noise threshold to the BG+5 regime at wind speeds where measured background noise data becomes increasingly sparse and where reliance upon regression-derived and extrapolated values becomes more significant. The consequence is that the applicable noise limits are no longer determined by a fixed criterion but instead become directly influenced by the predicted behaviour of the background noise regression curves.

This issue is particularly important because the transition to the BG+5 regime occurs within the same wind speed range where the proposed turbines are generating their highest sound power outputs. Appendix 11.4 confirms that the proposed Nordex N163 turbines reach maximum sound power emissions at approximately 7m/s wind speed and continue to operate at these levels at higher wind speeds. Consequently, the assessment becomes most dependent upon extrapolated background noise values at precisely the point where operational turbine noise is greatest and where compliance margins are most likely to become constrained.

The interaction between these factors creates a compounding effect. As turbine noise emissions increase towards maximum operational levels, the applicable noise limits become increasingly dependent upon regression-derived background noise values which are supported by a diminishing quantity of measured survey data. In practical terms, relatively small changes to the regression curve at higher wind speeds may influence the applicable BG+5 criterion and, by extension, the reported compliance outcome at individual receptors.

The concern is not that the BG+5 methodology itself is inappropriate, but rather that the reliability of the methodology is only as robust as the underlying dataset upon which it is based. Where extensive measured data exists across the full range of wind speeds, the resulting regression relationship can generally be regarded with a greater degree of confidence. However, where the assessment increasingly relies upon extrapolated values at higher wind speeds, a greater degree of uncertainty is introduced into both the applicable noise limits and the subsequent compliance assessment.

This issue assumes additional significance when considered alongside the relatively limited compliance margins identified at a number of Noise Sensitive Locations and the need for operational mitigation measures at certain receptors to achieve compliance. In such circumstances, confidence in the accuracy of the adopted background noise relationships becomes critically important. Any uncertainty associated with the extrapolated higher wind speed data has the potential to influence the reported compliance position and the assessment of likely effects on residential amenity.

Accordingly, it is submitted that the assessment has not adequately demonstrated the robustness of the BG+5 regime at higher wind speeds and that the compliance conclusions become increasingly dependent upon extrapolated background noise values within the very wind speed range where operational turbine noise emissions are at their greatest. This introduces a material degree of uncertainty into the assessment and further undermines confidence in the conclusion that the proposed development can operate without giving rise to unacceptable noise impacts on nearby residential properties.

7.3.5 Cumulative Noise Assessment and Lacka/Skehanagh Wind Farm

A further significant concern relates to the treatment of cumulative operational noise effects arising from the interaction between the proposed development and existing wind energy developments within the wider area. While the EIAR acknowledges the presence of existing wind farm developments and undertakes a cumulative assessment, the conclusions reached are heavily reliant upon the application of screening methodologies which do not adequately address the actual cumulative noise environment likely to be experienced by nearby residents.

The EIAR places considerable reliance upon the Institute of Acoustics Good Practice Guide ("IoA GPG") 10 dB screening rule in determining whether cumulative effects require further consideration. In particular, the applicant relies upon Section 5.1.5 of the IoA GPG to conclude that certain cumulative effects associated with the existing Lacka/Skehanagh Wind Farm are not significant and can be scoped out of detailed assessment. While the 10 dB rule may serve a useful technical function in managing the scope of acoustic modelling exercises, it does not remove the obligation on the Commission to consider the actual cumulative environmental effects experienced at residential receptors.

The distinction is important. The purpose of Environmental Impact Assessment is to evaluate the cumulative environmental conditions likely to be experienced by residents rather than merely to apportion responsibility for those effects between individual developments. From a residential amenity perspective, the relevant question is not whether a particular noise contribution originates from the proposed development or an adjacent wind farm in isolation, but rather the total cumulative noise environment experienced at the receptor location.

Of particular concern is the fact that the applicant's own cumulative modelling identifies a number of receptors where cumulative night-time noise levels approach, and in certain instances exceed, the applicable assessment criteria. While the applicant subsequently seeks to discount these exceedances through application of the 10 dB screening methodology, the practical reality remains that residents at these locations may experience cumulative operational noise levels above the relevant assessment thresholds.

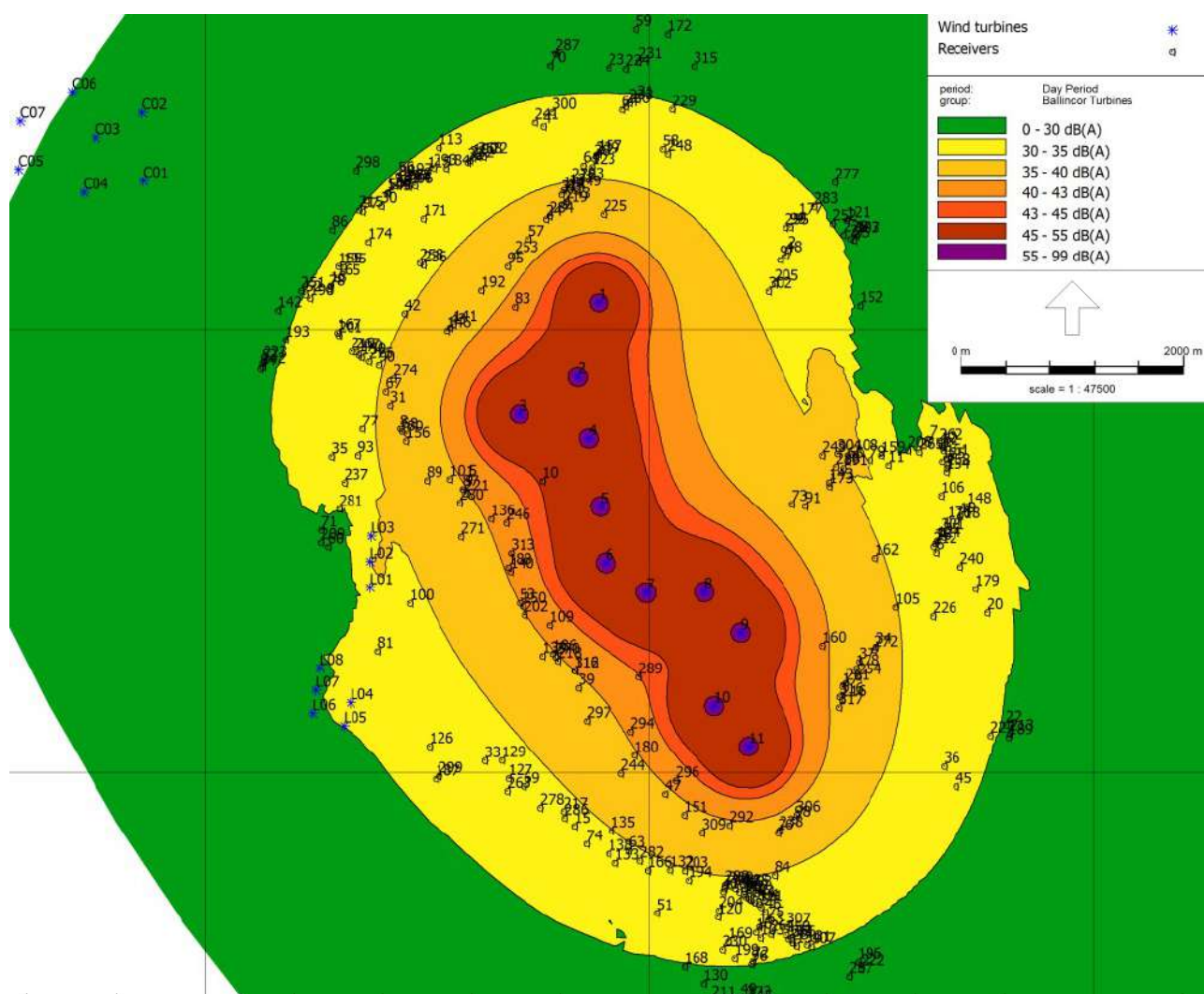


Fig. 22: Noise Sensitive Locations Identified within the Cumulative Noise Assessment Area (Source: EIAR Chapter 11 and Appendix 11.6)

Our client respectfully submits that the approach adopted effectively conflates a technical modelling scoping exercise with the broader planning assessment of cumulative environmental effects. The IoA GPG screening provisions were not intended to displace the requirement for a comprehensive assessment of cumulative impacts under the EIA Directive, nor can they negate the obligation to consider the actual noise environment likely to be experienced by residents throughout the operational life of the development.

This issue is particularly significant in circumstances where compliance margins are already relatively limited at a number of receptors and where operational curtailment measures are required to achieve compliance under certain operating conditions. In such circumstances, the cumulative interaction between the proposed development and existing wind farm developments assumes greater importance, particularly during night-time periods when background noise levels are lower and residents are more sensitive to disturbance.

Accordingly, it is submitted that the cumulative assessment presented within the EIAR does not provide a sufficiently robust basis upon which to conclude that cumulative noise impacts will remain acceptable throughout the operational life of the development. The reliance upon screening methodologies to discount identified cumulative effects introduces a material degree of uncertainty into the assessment and further undermines confidence in the conclusion that residential amenity will be adequately protected.

7.3.6 Failure to Demonstrate Compliance with Offaly County Development Plan DMS-109

The GBWAG further submits that the proposed development has failed to adequately demonstrate compliance with Development Management Standard DMS-109 of the Offaly County Development Plan 2021–2027.

DMS-109 sets out the criteria against which wind energy developments are to be assessed and expressly requires consideration of a range of environmental and residential amenity matters. Of particular relevance to the current proposal, DMS-109 requires the Planning Authority to consider the:

Impact on human health in relation to noise disturbance (including consistency with the World Health Organisation's 2018 Environmental Noise Guidelines for the European Region), shadow flicker and air quality.

The wording of the Development Management Standard is significant. It does not merely require compliance with ETSU-R-97 or the Wind Energy Development Guidelines. Rather, it specifically requires consideration of consistency with the World Health Organisation's *Environmental Noise Guidelines for the European Region* (2018) when assessing potential noise impacts associated with wind energy development.

Having reviewed Chapter 11 of the EIAR, Appendix 11.4, the Noise Impact Assessment and associated supporting documentation, the GBWAG is unable to identify any substantive assessment of the proposal against the WHO Environmental Noise Guidelines for the European Region (2018). While the documentation contains extensive reference to ETSU-R-97, the Wind Energy Development Guidelines for Planning Authorities and associated Irish guidance, there is no clear assessment demonstrating how the predicted operational noise environment has been evaluated against the recommendations contained within the WHO Guidelines or how consistency with those guidelines has been established. This omission is particularly noteworthy given that the WHO Environmental Noise Guidelines were published subsequent to ETSU-R-97 and were expressly referenced by the elected members of Offaly County Council when adopting DMS-109. The inclusion of a specific reference to the WHO Guidelines within the Development Plan must be regarded as a deliberate policy requirement rather than a purely aspirational or informative statement. Accordingly, an applicant seeking permission for a wind energy development should be expected to clearly demonstrate how the proposed development aligns with, or otherwise addresses, the recommendations contained within those guidelines.

The absence of such an assessment creates a significant evidential gap within the application documentation. While the applicant may contend that compliance with ETSU-R-97 is sufficient to demonstrate acceptable noise impacts, DMS-109 establishes a broader policy framework requiring consideration of consistency with the WHO Environmental Noise Guidelines in addition to the national wind energy guidance documents. Compliance with one element of the policy framework cannot automatically be assumed to constitute compliance with all elements.

Furthermore, this omission assumes greater significance when considered alongside the concerns identified elsewhere within this submission regarding the robustness of the background noise survey, the reliance upon extrapolated BG+5 assessment criteria at higher wind speeds, the limited compliance margins identified at a number of Noise Sensitive Locations and the reliance upon operational mitigation measures to achieve compliance under certain operating scenarios. In circumstances where the assessment already contains a degree of uncertainty, the absence of a clearly documented assessment against the WHO Environmental Noise Guidelines further undermines confidence in the conclusions reached regarding residential amenity and human health.

The GBWAG therefore submits that the application documentation has failed to adequately demonstrate compliance with Development Management Standard DMS-109 of the Offaly County Development Plan 2021–2027. In the absence of a clear assessment of consistency with the WHO Environmental Noise Guidelines for the European Region (2018), the Commission cannot be satisfied that the proposal fully accords with the adopted Development Plan or that the potential effects of operational noise on human health and residential amenity have been comprehensively assessed.

7.3.7 Residential Amenity Implications

Having regard to the foregoing concerns relating to baseline noise monitoring, the use of extrapolated background noise data, the limited compliance margins identified at a number of Noise Sensitive Locations, the unresolved questions surrounding cumulative noise impacts and the absence of a clear assessment against the WHO Environmental Noise Guidelines for the European Region (2018), the GBWAG submits that the Commission cannot be satisfied that the proposed development would not result in adverse effects on residential amenity.

While the Noise Impact Assessment concludes that the proposed development can operate within the applicable noise limits, these conclusions are dependent upon a series of assumptions, modelling exercises and mitigation measures. As set out in the preceding sections of this submission, a number of these assumptions introduce uncertainty into the assessment process, particularly in relation to the characterisation of background noise conditions at higher wind speeds, the treatment of cumulative impacts and the reliance upon predicted rather than measured operational performance.

Of particular concern is the limited margin of compliance identified at certain Noise Sensitive Locations. Where predicted noise levels approach applicable assessment thresholds, even relatively minor variations in turbine performance, meteorological conditions, background noise characteristics or cumulative operational effects may materially influence the actual noise environment experienced by nearby residents. In such circumstances, the degree of confidence that can be attached to the assessment conclusions is necessarily reduced.

The potential implications for residential amenity extend beyond compliance with numerical noise limits. The planning assessment must also consider the broader effects of wind turbine noise on the enjoyment of residential property, quality of life and the reasonable expectation of tranquillity within a rural environment. These considerations are expressly recognised within the Offaly County Development Plan 2021–2027 and are reflected in the requirement to consider impacts on human health and residential amenity.

The World Health Organisation has identified environmental noise as a factor capable of contributing to sleep disturbance, annoyance and broader quality of life impacts. While the GBWAG does not contend that significant adverse effects have

been conclusively demonstrated, it is submitted that the current assessment does not adequately eliminate uncertainty regarding the potential for such effects to arise at all affected receptors over the operational lifetime of the development. Furthermore, the Commission should have regard to the cumulative nature of the receiving environment. Residents may experience the combined effects of multiple wind energy developments across the wider area together with associated changes to landscape character and rural amenity. In circumstances where cumulative noise effects have not been fully resolved, it cannot be assumed that the operational experience of residents will correspond precisely with the conclusions of the applicant's modelling exercise.

Accordingly, the GBWAG submits that insufficient information has been provided to conclusively demonstrate that the proposed development would not give rise to unacceptable impacts on residential amenity. The uncertainties identified throughout the noise assessment, when considered collectively, raise reasonable doubt as to whether the proposal can consistently operate without adverse effects on the living conditions, quality of life and rural residential amenity of nearby residents throughout the lifetime of the development.

7.3.8 Specialist Consultant Submission (Appendix 1)

In addition to the noise and vibration concerns set out above by BPS, our client relies upon the further specialist noise consultant submission enclosed at Appendix 1 to this report. That submission should be read as forming part of this objection and sets out additional technical grounds in respect of the adequacy, methodology and reliability of the applicant's noise assessment.

This submission notes the following points:

Issues in the AWN Noise study:

- Systematic Selection of Most Permissive Inputs
- Daytime threshold set at 40 dB (upper end of the WEDG 35–40 dB range) despite most receptors sitting in areas where background noise can't reach 25 dB
- Ground absorption value of $G=0.5$ chosen, which produces lower predicted levels
- Receiver height set at 4 m, further reducing predictions
- Summer-only survey season under-represents high wind speeds
- Each choice is individually permissible, but in combination they consume every available margin, leaving no headroom for errors or omissions such as the ones below

Valley Correction Not Applied

- The IoA Good Practice Guide (§4.3.9) requires a +3 dB correction for propagation across concave ground profiles / valleys — the Ballincor site is textbook valley geometry
- An exhaustive search of all eight Ballincor noise documents returned zero references to "concave," "valley," "+3 dB," "4.3.9," "JOULE," "ground profile," "falls away," or " h_m "
- No receptor elevation data is included anywhere in the submission
- The correction was not assessed at any receptor, despite being mandatory on a per-turbine-per-receptor basis
- Three concurrent Irish wind farm assessments (Cooloo, Seskin, Ballinla) all assess §4.3.9 explicitly — Ballincor is the outlier
- Community analysis applying the JOULE formula to AWN's own data produces ten confirmed night-time exceedances at non-stakeholder properties

Cumulative Noise — Asymmetric Treatment of Lacka/Skehanagh Wind Farm

- AWN's own cumulative model identifies night-time exceedances at five non-stakeholder properties (H071, H081, H100, H209, H281), ranging from +1.0 dB to +2.2 dB above the WEDG 2006 43 dB night-time limit
- The developer dismisses these exceedances as "not relevant" by invoking IoA GPG §5.1.5 (the 10 dB scoping rule)
- §5.1.5 is an acoustics scoping rule for managing modelling scope — it does not override the planning authority's obligation to assess cumulative impact under the EIA Directive
- The planning question is what residents will actually experience, not which source the noise is attributed to
- Residents at these five properties will be exposed to noise above the sleep-protection threshold regardless of how the contribution is decomposed between Ballincor and Lacka/Skehanagh
- Absence of Background Data at High Wind Speeds (7–9 m/s)
- All seven NMLs were surveyed over ~10 weeks in summer only (July–September 2022), systematically missing the autumn/winter high-wind-speed conditions
- AWN's own parenthesis convention in Table 11-10 flags the 8 and 9 m/s values as extrapolated, not measured
- Data point counts above 7 m/s are critically low (e.g., NML3 has zero data points above 8 m/s; NML1 has only 8 points above 7 m/s)
- The turbines are loudest at these wind speeds — the Nordex N163 reaches maximum rated sound power at WS7 and holds it at WS8+
- The BG+5 regime kicks in at these speeds, meaning the extrapolated background values directly determine the noise limit
- Compliance margins are already tight at WS7–WS8, and all ten valley-correction exceedances occur at WS8

- Peer comparison: Ballinla presents regression curves fitted to measured data extending to 14 m/s across seasons; Ballincor does not

The BG+5 "Flip" Interaction:

- Awn applies the 40 dB low-noise floor only at very low wind speeds, then pivots to BG+5 as soon as the regression curve exceeds 30 dB
- This pivot occurs precisely in the wind speed range where background data is least reliable (extrapolated rather than measured)
- The two choices reinforce each other in the applicant's favour: the low-noise classification is abandoned at the point where the supporting data is weakest

Offaly CDP DMS-109 / WHO 2018 Consistency:

- The Offaly County Development Plan requires "consistency with the World Health Organisation's 2018 Environmental Noise Guidelines" for wind energy applications
- The application does not demonstrate this consistency — a documentary failure to address an applicable Development Management Standard

Our client respectfully requests that An Coimisiún Pleanála have full regard to the specialist noise submission at Appendix 1 when assessing the likely noise impacts of the proposed development on residential amenity and human health.

7.4 Ground 4: Shadow Flicker: Incomplete Receptor Identification and Potential Non-Compliance

The shadow flicker assessment identifies a material potential for shadow flicker effects at a significant number of sensitive receptors within the 10 rotor diameter study area. While the applicant proposes mitigation through turbine shutdown systems and screening measures, the assessment gives rise to concerns regarding receptor identification, the extent of pre-mitigation exceedances, reliance on "expected" rather than worst-case results, and the deferral of final mitigation details to the operational stage.

7.4.1 Applicable Guidance and Assessment Thresholds

The assessment of shadow flicker must be considered having regard to the applicable national guidance, the relevant Development Plan provisions and the applicant's own stated assessment methodology. Shadow flicker is a recognised operational effect of wind turbine development arising where rotating turbine blades intermittently obstruct sunlight and cast moving shadows across windows or other sensitive openings. The EIAR itself acknowledges that shadow flicker is dependent upon a range of factors including the relative position of turbines and receptors, the orientation of windows, distance from turbines, direct sunlight, time of day and year, wind speed, wind direction, terrain and intervening screening. The relevant statutory and policy framework does not treat shadow flicker as an immaterial or incidental matter. Rather, it is expressly identified in the Wind Energy Development Guidelines for Planning Authorities 2006, the Draft Revised Wind Energy Development Guidelines 2019, the Offaly County Development Plan 2021–2027 and the Tipperary County Development Plan 2022–2028 as a matter requiring assessment in the context of residential amenity and human health.

The EIAR confirms that the 2006 Wind Energy Development Guidelines recommend that shadow flicker at neighbouring offices and dwellings within 500 metres should not exceed 30 hours per year or 30 minutes per day. The EIAR further acknowledges that the 2006 Guidelines state that, at distances greater than 10 rotor diameters from a turbine, the potential for shadow flicker is very low, and that where shadow flicker could be a problem, developers should provide calculations to quantify the effect and, where appropriate, take measures to prevent or ameliorate the potential effect, including by turning off a particular turbine at certain times.

In this regard, the applicant has adopted a 10 rotor diameter study area for the purposes of the assessment. Given that the proposed turbine rotor diameter is stated to be between 149 metres and 163 metres, the EIAR confirms that all sensitive receptors within 1.63 kilometres of the proposed turbine locations have been included in the shadow flicker assessment. The applicant further states that, for the purposes of the assessment, the 2006 Guidelines threshold of 30 hours per year or 30 minutes per day has been applied to all sensitive receptor locations within 1.63 kilometres of a proposed turbine location.

This is an important point. The application is not one in which shadow flicker is screened out as a remote or theoretical issue. Rather, the applicant's own methodology proceeds on the basis that a substantial study area is required, extending to 1.63 kilometres from the proposed turbines, and that all sensitive receptors within that area require assessment against the recognised daily and annual shadow flicker thresholds.

The Draft Revised Wind Energy Development Guidelines 2019 are also of relevance. While not yet formally adopted, the EIAR expressly states that the assessment is cognisant of the content and proposed measures set out in the Draft Revised Guidelines. The EIAR acknowledges that the Draft Revised 2019 Guidelines require a Shadow Flicker Study to accompany all planning applications for wind energy development and further provide that, where modelling indicates potential shadow flicker at any dwelling or affected property, a design review should be undertaken to consider whether one or

more turbines can be relocated to eliminate the occurrence of shadow flicker. Where such design avoidance cannot be achieved, automated turbine shutdown measures are required.

Most significantly, the Draft Revised 2019 Guidelines envisage a materially more stringent approach than the 2006 Guidelines. The EIAR quotes the Draft Revised Guidelines as stating that the planning authority or An Bord Pleanála should impose conditions to ensure that no existing dwelling or other affected property will experience shadow flicker as a result of the wind energy development. The EIAR itself acknowledges that this approach provides for the prevention of shadow flicker by automatic shutdown of turbines and that, under this approach, no amount of shadow flicker per day or per year would be acceptable.

The Development Plan context is also relevant. The EIAR confirms that the Offaly County Development Plan 2021–2027 requires regard to be had to the Wind Energy Development Guidelines and any amendments thereto and identifies impact on human health in relation to noise disturbance, shadow flicker and air quality as a relevant consideration. Similarly, the Tipperary County Development Plan 2022–2028 requires wind energy developments to comply with the 2006 Wind Energy Development Guidelines and any updated national guidance and requires developers to demonstrate that proposed turbines are designed and located so that nearby dwellings will be largely unaffected by shadow flicker.

Accordingly, the relevant planning framework establishes three important principles. First, shadow flicker is a recognised operational effect requiring specific assessment. Second, sensitive receptors within 10 rotor diameters require particular scrutiny, especially where daily or annual thresholds may be exceeded. Third, current policy direction is moving toward the elimination, or near elimination, of shadow flicker at affected dwellings through design avoidance and automated turbine shutdown.

It follows that the applicant must demonstrate, with a high degree of certainty, that all sensitive receptors within the shadow flicker study area have been correctly identified, that the predicted effects have been robustly assessed, and that enforceable mitigation measures are capable of ensuring compliance throughout the operational life of the development. The Commission should not treat post-consent turbine shutdown measures as a substitute for a robust assessment of the pre-mitigation effects or for clarity regarding the receptors affected. The applicable guidance places the primary emphasis on careful site selection, design, avoidance and prevention of shadow flicker effects in the first instance.

7.4.2 Receptor Identification and Study Area Uncertainty

A further concern arises in respect of receptor identification and the reliability of the receptor dataset used within the shadow flicker assessment. The applicant has adopted a 1.63 kilometre study area from the proposed turbine locations, based on ten rotor diameters of the largest proposed rotor diameter of 163 metres. This approach is appropriate in principle, having regard to the applicant's stated methodology and the guidance discussed in the preceding section. However, the robustness of the assessment is necessarily dependent upon the accurate identification, classification and assessment of every sensitive receptor within that defined study area.

The EIAR states that sensitive receptors were identified through a combination of publicly available mapping, aerial imagery, street-level imagery and Geodirectory address data. The EIAR further states that this was followed by a ground-truthing exercise and a search of planning applications within 1.63 kilometres of the proposed turbine locations, most recently carried out in September 2025, to identify proposed developments and consented but not yet constructed development. The assessment therefore relies upon a receptor identification exercise which involves a number of judgement-based steps, including the classification of buildings as sensitive or non-sensitive, the exclusion of certain buildings such as farm sheds, garages and derelict structures, and the inclusion of derelict houses only where they could be reoccupied without planning permission.

While such a methodology may be capable of forming the basis of a shadow flicker assessment, it must be transparent and internally consistent. In this instance, there appears to be an inconsistency within Chapter 16 regarding the total number of receptors identified and assessed. Section 16.3.1 states that a total of 126 sensitive receptors were identified and presented in Table 16-1. However, Section 16.4.3 subsequently states that 81 receptors "of the 129 included in the modelling assessment" would experience some level of daily shadow flicker under worst-case conditions. This discrepancy between 126 identified receptors and 129 receptors included in the modelling assessment requires clarification.

This is not a minor drafting issue. The identification and inclusion of receptors is central to the reliability of the assessment and to the conclusions reached regarding potential effects on residential amenity. If the correct number of receptors is 126, the reference to 129 receptors raises uncertainty as to whether additional receptors were included in the modelling but not clearly presented or explained. Conversely, if the correct number is 129, then the statement that 126 sensitive receptors were identified may indicate that the receptor schedule is incomplete or that the basis for inclusion/exclusion has not been adequately explained.

The issue is compounded by the fact that the receptor identifiers used in the shadow flicker chapter are non-sequential, which the EIAR explains as arising from refinement of the original receptor dataset following the ground-truthing exercise. While this may be understandable from a modelling perspective, it reduces the transparency of the assessment for affected residents and third parties attempting to verify whether their property, a nearby dwelling, a derelict but reoccupiable dwelling, or a recently permitted development has been included.

In circumstances where the applicant's own modelling identifies widespread pre-mitigation shadow flicker effects, the Commission must be satisfied that no sensitive receptor has been omitted or incorrectly classified. This is particularly important having regard to the reliance placed by the applicant on automated shutdown measures, which depend upon the correct pre-programming of receptor co-ordinates and the accurate identification of all properties capable of experiencing shadow flicker.

It is therefore submitted that the receptor identification exercise requires further clarification. At a minimum, the applicant should be required to provide a complete and reconciled receptor schedule identifying all buildings within the 1.63 kilometre study area, their classification, their planning status where relevant, whether they were included or excluded from the modelling, and the reason for any exclusion. In the absence of such clarification, the Commission cannot be satisfied that the shadow flicker assessment has comprehensively assessed all sensitive receptors within the relevant study area.

7.4.3 Applicant's Own Modelling Demonstrates Significant Pre-Mitigation Exceedances

The applicant's own shadow flicker modelling demonstrates that, prior to mitigation, the proposed development has the potential to give rise to significant shadow flicker effects at a substantial number of sensitive receptors. This is a critical point. The proposal is not one where shadow flicker is marginal, isolated, or confined to a small number of receptors. Rather, the modelling confirms that a large number of dwellings within the defined 1.63 kilometre study area are predicted to experience shadow flicker under the applicant's own worst-case assessment scenario.

Section 16.4.3 of the EIAR states that, based on worst-case conditions and without mitigation, 81 receptors of those included in the modelling assessment would experience some level of daily shadow flicker. More significantly, the EIAR confirms that 46 of these receptors are predicted to experience shadow flicker in excess of the 30 minutes per day threshold identified in the 2006 Wind Energy Development Guidelines. The same section further states that the 30 hours per year annual threshold is predicted to be exceeded at 41 receptors in the worst-case annual scenario.

These are not insignificant or theoretical effects. The applicant's own modelling therefore demonstrates that the receiving environment is highly sensitive to shadow flicker impacts arising from the proposed turbine layout. The extent of the predicted pre-mitigation exceedances is such that the proposed development can only be presented as acceptable through reliance on subsequent reductions, assumptions and operational mitigation measures.

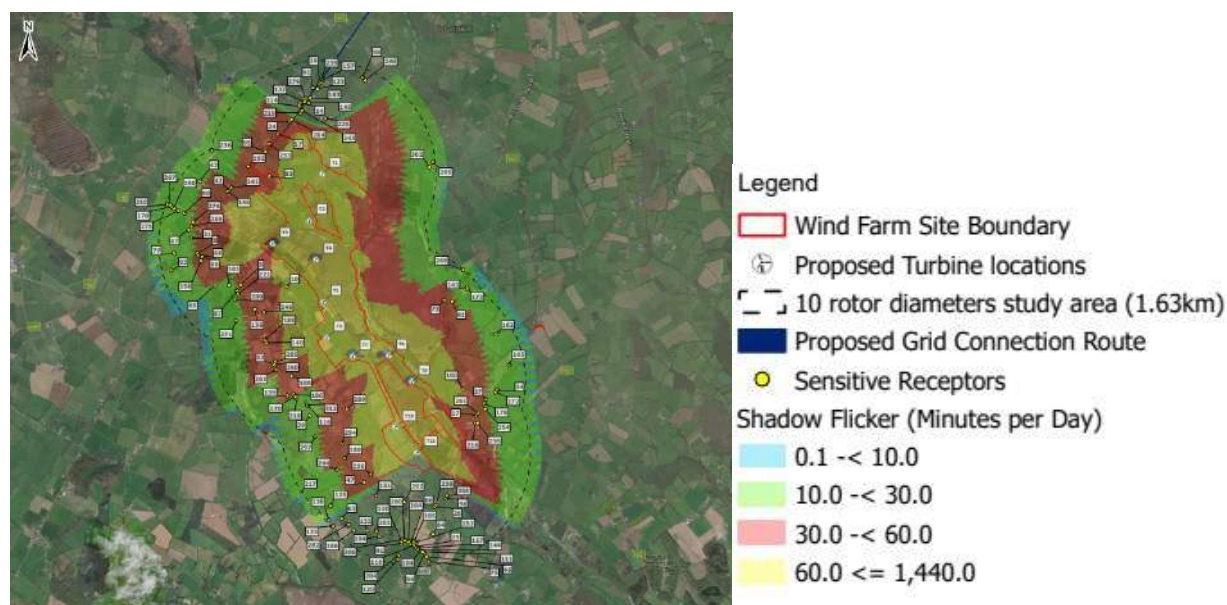


Fig. 23: Shadow Flicker Minutes per Day – WTGs N163 (Source: EIAR Chapter 16, Figure 16-1)

Figure 16-1, which at 6 pages long is too long to long to extract into this report, is particularly important in this regard, as it illustrates the spatial extent of predicted shadow flicker effects associated with Scenario 1, comprising the N163 turbine configuration. The EIAR confirms that Scenario 1 represents the maximum extent of the moving shadow and encompasses the full range of turbine dimensions proposed. This figure therefore provides a clear visual demonstration of the extent to which sensitive receptors are located within areas predicted to experience shadow flicker effects.

Table 16-1 further confirms the significance of the pre-mitigation effects. A number of receptors are predicted to experience daily shadow flicker considerably in excess of the 30-minute threshold. By way of example, receptor 10 is predicted to experience up to 1 hour and 6 minutes of daily shadow flicker and 139 hours and 53 minutes annually in the worst-case scenario. Receptor 83 is predicted to experience up to 50 minutes per day and 98 hours and 57 minutes annually. Receptor 160 is predicted to experience up to 1 hour per day and 99 hours and 59 minutes annually. Receptor 296 is predicted to experience up to 55 minutes per day and 77 hours and 21 minutes annually. These examples demonstrate that the predicted exceedances are material in both daily and annual terms.

The applicant seeks to reduce the significance of these results by reference to "expected" or "realistic" annual values, which take account of sunshine probability and wind direction. While such modelling adjustments may be relevant to the estimation of likely occurrence, they do not alter the fundamental point that the turbine layout has the inherent potential to generate substantial shadow flicker effects across a wide receptor area. The worst-case assessment is important because it identifies the receptors at risk and demonstrates the extent of dependence on post-assessment assumptions and mitigation controls.

It is also relevant that the EIAR concludes that, before mitigation measures are applied, the likely effect from shadow flicker in the worst-case scenario is "significant" and "periodic" over the long term at a defined number of receptors. This is a notable acknowledgement. The applicant's own assessment therefore accepts that, absent mitigation, the proposed development would give rise to significant shadow flicker effects at multiple sensitive receptors.

In planning terms, this level of pre-mitigation impact is highly material. The acceptability of the proposed development is dependent upon the effectiveness, accuracy and enforceability of turbine shutdown and control measures. The Commission should therefore approach the applicant's residual impact conclusions with caution and should not treat the existence of proposed operational mitigation as negating the significance of the pre-mitigation effects identified within the EIAR.

The GBWAG submits that the applicant's own modelling confirms that shadow flicker is a substantial issue in the context of the proposed development. The extent of predicted pre-mitigation exceedances demonstrates that the receiving environment is sensitive to shadow flicker and that the proposal is not acceptable on its own merits without strict, verifiable and enforceable mitigation. In the absence of such controls, the Commission cannot be satisfied that residential amenity will be adequately protected.

7.4.4 Over-Reliance on "Expected / Realistic" Results and Operational Shutdown Mitigation

A further concern arises from the manner in which the applicant seeks to reduce the significance of the worst-case shadow flicker results by reliance on "Expected (Realistic)" annual values and subsequent operational mitigation. While it is accepted that factors such as sunshine probability, wind direction, wind speed and turbine orientation may reduce the actual occurrence of shadow flicker in practice, these assumptions do not remove the significance of the applicant's own worst-case modelling, which identifies extensive exceedances of the applicable daily and annual thresholds across a substantial number of sensitive receptors.

The EIAR states that the worst-case model assumes 100% sunshine during daylight hours, maximum rotor orientation toward receptors, continuous turbine operation and no screening from vegetation, buildings or other obstacles. The applicant then applies statistical reductions having regard to sunshine probability and wind direction, noting that Met Éireann data indicates that sunshine occurs on average for approximately 30% of daylight hours per year and that prevailing wind direction will reduce the likelihood of turbines being orientated to cast maximum shadow at receptors. On this basis, the applicant presents "Expected (Realistic)" values which significantly reduce the annual shadow flicker results when compared with the worst-case assessment.

However, the GBWAG submits that these expected values should be approached with caution. The worst-case results remain important because they identify the full potential impact envelope of the proposed development and the properties which are capable of experiencing shadow flicker under particular solar, meteorological and operational conditions. The application of statistical reductions does not alter the fact that the proposed turbine layout has the inherent capacity to generate exceedances at numerous receptors. Nor does it eliminate the need for robust, enforceable and independently verifiable mitigation.

The EIAR itself acknowledges that pre-mitigation worst-case effects would be significant and periodic over the long term at a defined number of receptors. The acceptability of the proposed development is therefore not derived from the absence of shadow flicker risk, but from the applicant's commitment to operational control measures intended to reduce effects to "near zero". This is an important distinction. The proposal is only presented as acceptable on the basis that the turbine shutdown system will operate accurately, consistently and effectively throughout the operational lifetime of the wind farm.

The applicant proposes to install shadow flicker control systems on turbines with the potential to cause shadow flicker at nearby properties. These systems are stated to operate by detecting or calculating, in real time, whether shadow flicker has the potential to affect nearby properties based on pre-programmed co-ordinates for the properties and turbines, together with wind speed, wind direction and sunlight intensity. Where the relevant conditions occur, the turbine is to shut down and restart once the potential for shadow flicker has ceased.

While such mitigation may be capable of reducing effects, it is inherently dependent upon the accuracy of the receptor dataset, the correct programming of turbine and receptor co-ordinates, the reliability of real-time light sensors and software, the final turbine specification, the adequacy of pre-construction modelling and the effectiveness of ongoing operational monitoring. These matters are particularly important in the present case, given the apparent discrepancy in the number of sensitive receptors identified and modelled, and the reliance placed on an updated model to be prepared at pre-construction stage once the detailed turbine specifications are confirmed.

The EIAR further indicates that complaints from local residents will be investigated by the wind farm operator and that the turbine shutdown software may be adjusted where required. While such a complaints mechanism is welcome in principle, it is not a substitute for a robust pre-consent assessment and enforceable mitigation regime. A complaints-led approach places the burden on affected residents to identify and report impacts after they occur, rather than ensuring that impacts are prevented in the first instance.

The GBWAG further notes that the proposed mitigation is described as achieving “near zero” shadow flicker rather than complete elimination. The EIAR explains that a brief period of shadow flicker may still occur due to the time required for turbine blades to slow to a safe stop, potentially lasting between one and two minutes. While this may be described by the applicant as negligible, it reinforces the point that the mitigation does not wholly eliminate the occurrence of shadow flicker and that any permission would require clear and enforceable conditions defining acceptable performance standards.

Accordingly, the GBWAG submits that the Commission should not place undue weight on the “Expected (Realistic)” results as a basis for minimising the significance of the shadow flicker issue. The applicant’s own worst-case modelling demonstrates extensive potential for exceedance, and the residual acceptability of the proposal is dependent upon future operational controls, pre-construction modelling, software programming, resident complaints procedures and ongoing adjustment of mitigation systems. In the absence of strict, transparent and enforceable controls, the Commission cannot be satisfied that shadow flicker effects will be adequately prevented at all affected sensitive receptors.

7.4.5 Residential Amenity, Compliance and Need for Robust Controls

Shadow flicker is a predictable, avoidable and materially relevant residential amenity impact. Unlike certain other environmental effects which may be inherently variable or difficult to anticipate with precision, shadow flicker can be calculated in advance having regard to turbine location, receptor location, solar path, rotor diameter, hub height and turbine orientation. Accordingly, where shadow flicker effects are predicted to arise, the planning assessment should proceed on the basis that such effects must be prevented or strictly controlled rather than merely responded to after complaints are received.

The applicant’s own modelling demonstrates that, prior to mitigation, the proposed development has the potential to give rise to shadow flicker effects at a substantial number of sensitive receptors within the 1.63 kilometre study area. This is of particular significance in the context of residential amenity, as shadow flicker is experienced within the home environment and has the potential to interfere with the ordinary enjoyment of residential property. It is therefore not sufficient for the applicant to simply state that operational mitigation will be available. The Commission must be satisfied that the mitigation is comprehensive, enforceable, independently verifiable and capable of protecting all existing and permitted dwellings throughout the operational lifetime of the development.

The GBWAG acknowledges that the EIAR proposes a shadow flicker control system and indicates that turbines will shut down where relevant conditions arise. However, the effectiveness of this approach is dependent upon a number of critical factors, including the accuracy of the receptor dataset, the correct identification of all affected properties, the final turbine specification, the correct pre-programming of receptor and turbine co-ordinates, the reliability of sunlight sensors and turbine control software, and the adequacy of ongoing operational monitoring. Any uncertainty in these inputs has the potential to undermine the effectiveness of the mitigation regime.

This is particularly important where the applicant proposes to update the shadow flicker model at pre-construction stage once the detailed specifications of the chosen turbine model are confirmed. While such an update may be necessary, it also means that the final operational control model is not fully before the Commission at this stage. In circumstances where the acceptability of the proposal is heavily dependent upon operational shutdown mitigation, the GBWAG submits that the Commission should not rely on a general commitment to future modelling and software refinement without attaching strict and detailed conditions.

If the Commission is minded to grant permission, it is respectfully submitted that any permission must include a robust shadow flicker condition requiring, at minimum, that no existing or permitted dwelling shall experience shadow flicker, save for any unavoidable brief period associated with safe turbine shutdown. Such a condition should apply to all dwellings and sensitive receptors capable of being affected, whether identified in the submitted receptor schedule or subsequently identified prior to construction.

The GBWAG further submits that the following safeguards should be required as part of any permission:

- an updated receptor survey prior to commencement of development, including all existing dwellings, permitted dwellings, reoccupiable derelict dwellings and other sensitive receptors within the relevant study area;
- an updated shadow flicker model based on the final selected turbine model, final turbine dimensions, final turbine co-ordinates and a verified receptor dataset;
- independent verification of the shutdown model and receptor inputs prior to turbine operation;
- installation and commissioning of shadow flicker control systems before any turbine becomes operational;
- maintenance of automatic shutdown logs recording all predicted and actual shutdown events;
- publicly available annual reporting of shadow flicker complaints, shutdown events and mitigation performance;
- a clear complaints procedure with defined investigation timelines; and

- a requirement that turbine shutdown settings be amended immediately where shadow flicker is reported or verified at any dwelling.

In the absence of such controls, the GBWAG submits that the Commission cannot be satisfied that all affected receptors will be adequately protected. A complaints-led system, whereby residents must first experience and report shadow flicker before adjustments are made, would not represent an appropriate or precautionary approach to residential amenity protection. The emphasis must be on prevention, not retrospective correction.

Accordingly, the GBWAG submits that the proposed development gives rise to material shadow flicker concerns having regard to the scale of predicted pre-mitigation exceedances, the number of sensitive receptors within the study area, the reliance on operational shutdown mitigation and the need for further pre-construction modelling. Should the Commission be minded to grant permission, strict, enforceable and independently verifiable conditions are required to ensure that shadow flicker effects are eliminated, or reduced to the nearest achievable equivalent, at all affected dwellings.

7.4.6 Shadow Flicker Submission (Appendix 2)

In addition to the aforementioned subsections, a comprehensive submission has been produced and is attached as Appendix B of this report. In summary the grounds of appeal from the submission are as follows:

An Coimisiún Pleanála would be justified in refusing planning permission on shadow flicker grounds alone. The following grounds are each developed in detail below:

- Baseline Data – 3 compounding ...
- The terrain screening function was switched off in the model — directly contradicting what the EIAR claims was done.
- Dozens of properties sit above the lowest point of the rotor arc. The model treats all of them as if the turbine is overhead. It isn't.
- The model ignores shadow flicker that occurs when the sun is very low in the sky.
- For properties at higher elevation than the turbine bases, those are precisely the worst events.
- The study area is too small. The applicant's own software calculated shadow to distances greater than the stated boundary. 56 properties in that gap were never assessed.
- 44 properties lie within the simultaneous shadow zone of two or more turbines, within the applicant's own 1,630 metre boundary. The compound shadow flicker this produces has never been assessed.
- The health impacts on people with migraine, photosensitive epilepsy, and tinnitus have not been properly considered.
- The 30-minute-per-day limit has no medical basis. It was developed in the 1990s for much smaller turbines.
- Key data produced by the applicant's own software — specifically the total number of days per year that each property experiences any shadow flicker at all — was never included in the chapter presented to the Commission.
- The expected figures the applicant uses to claim compliance are based on weather data that is decades old, from a different weather station, and cannot be reconciled with the applicant's own climate change chapter.
- Carrig (Lacka) Wind Farm and Knockshegowna Wind Farm are both within 2km of proposed turbines. The IWEA guidelines the applicant cites require cumulative assessment in those circumstances. None was done.
- Receptor 217 appears on the applicant's own map but was never modelled.

7.5 Ground 5: Biodiversity (see expert report attached as Appendix 3)

This ground of objection relates to the adequacy of the biodiversity and ecological assessment submitted in support of the proposed development. In particular, the proposed development is located within a sensitive receiving environment comprising peatland, cutover bog, wet grassland, woodland, hedgerows, treelines, drainage ditches, the Little Brosna River corridor and habitats capable of supporting protected species and other ecological receptors.

The GBWAG's concerns in respect of biodiversity and ecology are addressed in detail in a separate specialist submission prepared by Pat Moran, which is enclosed at Appendix 3 to this report. That submission should be read as forming part of this objection and appeal submission.

By way of summary, the specialist submission raises concerns regarding the adequacy of the ecological baseline, the sufficiency and timing of surveys, the assessment of protected species and habitats, the treatment of bat and bird-related ecological interactions, the assessment of the grid connection route and associated infrastructure, the robustness of mitigation measures, and the degree of reliance placed on future surveys, post-consent measures, monitoring and adaptive management.

Our client is concerned that the application has not demonstrated, with the necessary level of certainty, that the proposed development can be constructed, operated and decommissioned without unacceptable effects on biodiversity and ecological receptors. This concern is particularly acute having regard to the scale of the proposed wind farm, the extent of associated infrastructure, the hydrological sensitivity of the site and surrounding lands, and the applicant's reliance on mitigation and management measures which require further refinement at later stages.

The GBWAG therefore requests that the Commission has full regard to the specialist biodiversity and ecology submission enclosed at Appendix 3 when assessing the adequacy of the EIAR, NIS and supporting ecological documentation. In the event of any conflict between the applicant's conclusions and the specialist submission, the GBWAG submits that a

precautionary approach should be adopted and that permission should not be granted unless the Board is satisfied that all ecological impacts have been fully, robustly and lawfully assessed.

For the avoidance of doubt, this section is intended to introduce and cross-reference the specialist biodiversity and ecology evidence prepared by Pat Moran. The detailed grounds of objection in respect of biodiversity and ecology are set out in full at Appendix 3.

7.6 Ground 6: Peat, Soils and Land Stability: Inadequate Assessment of Peat Disturbance, Excavation Stability and Carbon Impacts

The proposed development raises significant concerns in relation to peat, soft ground conditions, soil stability, spoil management and the carbon implications of disturbing and relocating peat soils. While the applicant has submitted a Land, Soils and Geology Chapter, a Ground Investigation Report, a Peat Stability Risk Assessment ("PSRA") and a Spoil and Peat Management Plan ("SPMP"), the GBWAG submits that these documents do not provide a sufficiently robust or certain basis upon which the Commission can conclude that the proposed development will not give rise to unacceptable impacts on peat, soils, land stability, water quality and peatland carbon functions.

The concern is not that peat and land stability have been wholly omitted from the application documentation. Rather, the applicant's own assessment confirms the presence of cutover peat, peaty soils, soft cohesive deposits, groundwater ingress, sidewall instability, deep excavations, borrow pits, floating roads, significant peat and spoil movement, peat deposition areas and reliance on ongoing geotechnical supervision. Notwithstanding this, the EIAR ultimately seeks to characterise the residual effects as not significant, primarily on the basis that the site comprises modified, drained or cutover peatland and that detailed design, construction-stage mitigation and geotechnical monitoring will control the identified risks.

The GBWAG submits that this approach materially understates the sensitivity and complexity of the receiving ground conditions. In planning and EIA terms, the issue is not limited to whether the site contains intact active raised bog. The relevant question is whether the proposed development, having regard to its scale, construction methodology, excavation requirements, peat relocation strategy, drainage works and proximity to watercourses, has been demonstrated to be acceptable on the basis of a sufficiently certain and precautionary assessment. It is submitted that it has not.

7.6.1 The Applicant's Own Documentation Confirms Material Peat and Soft Ground Conditions

The receiving environment is not a simple mineral-soil site. Chapter 8 confirms that the proposed wind farm site comprises a combination of improved grassland, cutover bog, grassland, mixed broadleaved woodland and coniferous forest. The applicant's mapping identifies cutover/cutaway peat, peaty poorly drained mineral soils, mineral alluvium, alluvial deposits, glacial till, gravels, eskers and cutover raised peat within the site and wider study area. The eastern boundary of the wind farm site is also associated with the Little Brosna River corridor, with alluvial soils located along the river floodplain.

The EIAR records that peat occurs within low-lying areas along the eastern side of the proposed wind farm site. It states that the minimum, maximum and mean peat depths recorded across 124 peat probe locations were 0.0m, 4.1m and 1.2m respectively. The EIAR further confirms that deeper peat was encountered at a number of proposed infrastructure locations, including T3, T4, T8 and T9. Peat depths of up to 3.1m are recorded at T3, deep peat is identified at T4, peat depths of 2.1m are recorded at T8 and peat depths of 3.2m are recorded at T9. Peat depths of 2.6m are also recorded in the vicinity of the proposed meteorological mast, while peat depths ranging from 0.8m to 2.8m are recorded along proposed internal site roads.



Fig. 24: Peat Depths (Source: EIAR Chapter 8, Figure 8-6)

The Ground Investigation Report similarly confirms that the site is currently a mixture of peat bogs, forests, wetland and agricultural land, and that the proposed construction is envisaged to comprise pile foundations, pavement make-up, local excavations for services and plant. The investigation encountered peat in multiple boreholes and trial pits, with peat present to depths between 0.45m and 3.80m below ground level. It also identified cohesive deposits, granular deposits, made ground and weathered bedrock, demonstrating variable ground conditions across the proposed development site.

This variability is highly material. The proposed development requires extensive construction activity, including turbine foundations, crane hardstands, access roads, borrow pits, trenching, drainage infrastructure, BESS/substation works and the repeated movement of heavy plant across the site. Where such works are proposed on or adjacent to peat and soft ground, the assessment must be robust, site-specific and precautionary. The fact that the peat has been historically cutover, drained or modified does not remove its relevance as a geotechnical, hydrological or carbon-sensitive receptor.

7.6.2 The Scale of Peat Excavation and Relocation is Significant

The applicant's own figures demonstrate that the proposed development would involve substantial disturbance and movement of peat, subsoil and stone. Chapter 8 includes a volume summary which identifies total infrastructure volume requirements of 113,625m³, comprising hardstanding foundations, turbine foundations, substation, BESS, compounds and access tracks. It also identifies a potential available borrow pit volume of 103,100m³, increasing to 113,400m³ when bulked,

and records total peat excavated of 87,600m³, increasing to 91,950m³ when bulked. Potential peat reuse areas are identified as 143,700m³.

Area	Volume required -compacted m ³ ¹¹	Potential site volume excavated (bulked in brackets)
Hardstanding Foundations	37,100	
Turbine Foundations	13,950	
Substation, BESS and Compounds	22,900	
Access Tracks	39,675	
Total volume required	113,625	
Total (potential) volume available from borrow pits 1-3		103,100 (113,400)
Total peat excavated		87,600 (91,950)
Potential peat reuse areas identified (PDA, borrow pit 2, 3) and along access track		143,700

Table 2: Volume Summary (Source: EIAR Chapter 8, Table 8-5)

The SPMP also records a substantial peat-handling requirement, albeit using a different figure. It states that the calculated volume of peat or peaty soils is 59,000m³ and that peat arisings are to be reused on site in designated areas, namely Peat Deposition Area 1, Borrow Pit 2 and Borrow Pit 3. It further states that peat or peaty soil will all be relocated within the proposed wind farm site and that construction will be sequenced so that works commence in the southern section of the site, with peaty soils stripped at T8/T9 and placed within Borrow Pits 2 and 3, followed by phased reinstatement of borrow pits.

Area	Potential Volume (m ³)	Ecological/Other Constraints	Proposed end use
PDA 1	16,200 m ³ - 16,200 m ² x 1.0m	No significant ecology constraints, no archaeological features encountered	Habitat creation
Borrow Pit 2	37,000 m ³ - 9,340 m ² x 4m	No significant ecology constraints, no archaeological features encountered	Restoration of borrow pits
Borrow Pit 3	75,000 m ³ - 18,720 m ² x 4m	No significant ecology constraints, no archaeological features encountered	Restoration of borrow pits

Table 3: PDA and Borrow Pits – Summary of the Spoil Areas (Source: Appendix 8-3 Spoil and Peat Management Plan, Table 2-1)

The GBWAG submits that the difference between the EIAR Chapter 8 peat excavation figure of 87,600m³ and the SPMP figure of 59,000m³ of peat or peaty soils requires clear explanation. It may be that the figures relate to different classifications, assumptions or categories of excavated material. However, in a development where peat stability, deposition capacity, borrow pit reinstatement, water quality protection and carbon loss are dependent upon accurate volume calculations, the application documentation should present a clear, reconciled and unambiguous peat and spoil balance.

This is not a minor point of presentation. If the lower figure is used to justify peat-handling methodology, while the higher figure reflects the total peat excavation burden for the project, the Commission must understand precisely how each figure has been derived, what material is included or excluded, where that material will be placed, and what contingency exists if actual peat volumes exceed the assumed quantities.

7.6.3 The PSRA Confirms Short-Term Excavation Instability Risk

The PSRA materially strengthens the GBWAG's concern. It expressly acknowledges that peat failures can cause fatalities, injury and damage to infrastructure and farmland, and can also cause significant damage to peatland habitats. It further states that excavation works on electricity infrastructure construction sites can induce slope failures due to the low basal strength in peat, even on relatively flat sites, and that such failures can extend significantly beyond the excavations, likely due to seepage forces caused by intentional or accidental drainage of peat.

This is a key admission. The applicant's own expert assessment recognises that peat stability risk is not eliminated merely because a site is relatively flat or historically modified. Excavations themselves can induce instability, and the consequences may extend beyond the immediate excavation area.

The PSRA identifies that during the geotechnical investigation, 23 trial pits were carried out and 12 of these encountered peat to depths between 0.2m and greater than 3.8m below ground level. Of the trial pits where peat was present, sidewall collapse or spalling was encountered in 9 of the 12. The PSRA states that this suggests peat excavations at the site will likely be unstable in the short term and that the likelihood of an excavation collapsing during construction is generally in the range "likely" to "probable" in the absence of mitigation.

This is one of the strongest statements in the applicant's own documentation. It confirms that instability is not speculative. It was observed during trial pitting, and the applicant's own PSRA concludes that peat excavations are likely to be unstable in the short term without mitigation.

The PSRA further states that the significance of a collapse could range from a very localised area up to a major peat slide event feeding into a watercourse. Again, this is highly material. The receiving environment includes drains and watercourses flowing towards the Little Brosna River, and the PSRA itself recognises that the consequences of collapse could, in a worst case, include a major peat slide event feeding into a watercourse.

Trial pit	Peat present?	Sidewall stability
TP01	No	Sidewalls spalling
TP01A	0.2m peaty TOPSOIL	Collapse >1.4m bgl
TP02	0.45m PEAT	Sidewalls collapsing >3.1m bgl
TP03	0.7m PEAT	Spalling & collapsing >1.2m bgl
TP04	>3.8m PEAT	Collapsing >1.5m bgl
TP05	No	Spalling & collapsing >2.6m bgl
TP06	No	Stable
TP07	No	Stable
TP08	2.1m PEAT	Sidewalls collapsing
TP09	2.7m PEAT	Spalling & collapsing >3.7m bgl
TP10	No	Spalling & collapsing >2.6m bgl
TP11	No	Spalling & collapsing >1.7m bgl
TP12	0.9m PEAT	Spalling & collapsing >3.2m bgl
TP14	No	Sidewalls collapsing
TP15	0.6m PEAT	Sidewalls collapsing
TP16	2.4m PEAT	Stable

TP17	0.7m PEAT	Collapsing >1.9m bgl
TP18	No	Collapsing >1.4m bgl
TP19	3.1m PEAT	Stable
TP20	1.1m PEAT	Stable
TP21	No	Sidewalls collapsing
TP22	No	Stable
TP23	No	Stable

Table 4: Trial Pit Summary – Peat Presence and Sidewall Stability (Source: Appendix 8-2 Peat Stability Risk Assessment, Table 2)

The GBWAG submits that this evidence is not adequately reflected in the applicant's ultimate conclusion of no significant residual effect. A project where peat excavations are identified by the applicant's own specialist as likely unstable in the short term in the absence of mitigation should not be treated as a straightforward or low-risk construction proposal.

7.6.4 Pre-Control Risks Are Reduced to "Negligible" Only Through Future Mitigation

The PSRA concludes that, following mitigation, all assessment areas fall into the "negligible" risk category and that the site is suitable for the proposed electricity generation development. However, this conclusion is heavily dependent upon mitigation and future control measures.

Table 7 of the PSRA identifies pre-control "low" risk ratings at several key infrastructure locations, including Turbine 2, Turbine 3, Turbine 4, Turbine 8, Turbine 9, the 110kV substation, the BESS and Peat Deposition Area 1. These are then reduced to "negligible" after mitigation. The applicant therefore does not demonstrate that the site is inherently negligible risk; rather, it demonstrates that the risk is reduced to negligible only after control measures are assumed.

Assessment Area	Pre-control measure risk rating	Post-control measure risk rating
Turbine 1	Negligible	Negligible
Turbine 2	Low	Negligible
Turbine 3	Low	Negligible
Turbine 4	Low	Negligible
Turbine 5	Negligible	Negligible
Turbine 6	Negligible	Negligible
Turbine 7	Negligible	Negligible
Turbine 8	Low	Negligible
Turbine 9	Low	Negligible
Turbine 10	Negligible	Negligible
Turbine 11	Negligible	Negligible
110kV substation	Low	Negligible
BESS	Low	Negligible
Peat Deposition Area 1	Low	Negligible
Borrow pit A	Negligible	Negligible
Borrow pit B	Negligible	Negligible
Borrow pit C	Negligible	Negligible
Met mast	Negligible	Negligible

Table 5: Peat Stability Risk Register Summary (Source: Appendix 8-2 Peat Stability Risk Assessment, Table 7)

The distinction is important. The proposed development is being presented as acceptable because future mitigation is assumed to operate successfully. This includes detailed design-stage PSRA, maintenance of hydrology, interceptor drains, experienced geotechnical staff, temporary works design, contractor method statements, geotechnical supervision, daily inspections, monitoring of peat movement and emergency response procedures.

The site-specific risk registers are also highly relevant. For Turbine 4, the PSRA identifies 4.2m peat from probes, vanes and trial pit TP04, and 5.3m very soft material in BH03. It records a drained factor of safety of 1.0 and undrained factor of safety of 1.8. For Turbine 8, the PSRA identifies 3.2m peat in GA08 and 3.1m peaty silt in TP08, with the relevant infrastructure within 10m of a watercourse. For Turbine 9, the PSRA identifies 3.2m peat in probes, greater than 3.7m peaty silt in TP09 and 12m of very soft material in BH02, again with the relevant infrastructure within 10m of a watercourse.

These are not immaterial conditions. They demonstrate that a number of the proposed turbines are located in areas with deep peat, very soft material, proximity to watercourses and reliance on site-specific temporary works. The Commission should therefore be cautious in accepting the simple post-mitigation "negligible" rating without independent scrutiny of the assumptions and mitigation measures upon which it relies.

7.6.5 Reliance on Future Detailed Design, Temporary Works and Contractor Controls

A recurring difficulty throughout the applicant's assessment is the extent of reliance placed on future detailed design, contractor method statements, geotechnical supervision, monitoring and "live" management plans. These measures may be appropriate as part of a construction management framework, but they are not a substitute for a complete and certain assessment at application stage.

The PSRA recommends that a design-stage PSRA be developed to include detailed descriptions of mitigations at specific locations. It also recommends detailed design of the drainage system, hydrological assessment of stream flows to inform culvert sizing, detailing of a monitoring regime for peat movement, identification of areas requiring site-specific temporary works design, specification of additional site investigations in specific risk areas and updating of the Peat Stability Risk Register.

The construction-stage recommendations include a geotechnical induction, appointment of a Site Geotechnical Supervisor, retention of a Site Geotechnical Folder, contractor method statements for each PSRA area, measures to maintain hydrology, limiting stockpile heights, removal of excavated material to designated deposition areas, stepping or battering back excavations, temporary sheet pile walls or rock fill berms, monitoring for peat movement, frequent monitoring of floating roads, robust drainage and daily sign-off by supervising staff.

The GBWAG does not object in principle to detailed construction controls. However, the extent of reliance on future design and contractor-led measures is significant. In several cases, the mitigation is not fully designed or fixed at application stage. For example, the PSRA states that specific temporary works design will be required at certain locations due to the size of excavation and likelihood that excavations will be open for a long time. It identifies potential solutions such as rock berms, shallow slope angles and daily inspections, but these are not presented as finalised design measures. The Ground Investigation Report similarly states that the recommendations provided should be verified in the design of the proposed turbines using the full details of loading conditions and allowable tolerable settlements/movements, and that founding strata should be inspected and verified by a suitably qualified engineer prior to construction. The report also states that the type, size and depth of pile foundations should be confirmed by a specialist piling contractor based on the loading from the proposed turbines.

In planning terms, this means that important elements of foundation design, excavation stability, temporary works, peat movement monitoring and hydrological control remain to be resolved after consent. That is a material issue because these matters go directly to whether the development can be constructed safely and without adverse environmental effects.

7.6.6 Peat Deposition, Borrow Pit Reinstatement and Spoil Storage Risks

The proposed development depends on the reuse of excavated peat and spoil within the site, principally in Peat Deposition Area 1 and Borrow Pits 2 and 3. The SPMP identifies PDA 1 as having capacity for 16,200m³, Borrow Pit 2 as having capacity for 37,000m³ and Borrow Pit 3 as having capacity for 75,000m³. Borrow Pit 1 is expressly not proposed for peat deposition and is instead to be used for flood compensation.

The reuse of peat on site may be preferable to off-site disposal in principle. However, it also creates its own environmental and stability risks. Excavated peat is structurally different from in-situ peat. Once disturbed, it can lose strength, release water, become difficult to handle, oxidise, generate sediment-laden runoff and require careful placement and monitoring. The SPMP recognises this by proposing controls around storage, transport, placement, monitoring and avoidance of unsuitable storage locations.

The SPMP states that the peat soils will be transported to the borrow pit/deposition area and that it is not proposed to store peat near T8/T9. It further states that excavated material should not be stored adjacent to turbine bases, on or adjacent to slopes greater than 5 degrees, or in areas of peat. Peat is not to be stored around turbine perimeters, and diffuse drainage lines and locally steep slopes should be avoided for peat storage. These safeguards are welcome, but they also demonstrate that peat storage and handling are sensitive matters requiring active management.

The SPMP further states that spoil will be deposited in layers of 0.8m, and that stored peat will be placed at the borrow pit below the current land profile to promote stability. It also confirms that monitoring of peat storage areas will be required during wet weather. In the GBWAG's submission, the Commission should require much greater clarity on final deposition design, including maximum placement depths, slope gradients, drainage controls, settlement monitoring, inspection frequency, trigger levels, contingency capacity and emergency response procedures.

The proposed sequencing also requires scrutiny. The SPMP indicates that the southern section of the wind farm and upgrades to southern roads will be constructed first, with Borrow Pits 2 and 3 becoming available to accept material at later stages. If phasing changes, if borrow pit excavation is delayed, if actual peat volumes exceed estimates, if weather conditions interfere with peat handling, or if unexpected ground conditions arise, the peat management strategy may

require significant alteration. This is precisely why the application should include a clear and reconciled peat/spoil balance and robust contingency strategy at consent stage.

7.6.7 Hydrological and Water Quality Linkages

The peat and soils issues cannot be assessed in isolation from hydrology and water quality. Peat excavation, access track construction, borrow pit excavation, drainage modification, cable trenching and groundwater management all have the potential to affect surface water pathways, sediment mobilisation and downstream receptors.

The PSRA identifies that the proposed wind farm is located west of the Little Brosna River and that several small streams or ditches cut through the site, draining towards the Little Brosna River. It includes a photograph of a typical existing drain cut into peat between Turbine 8 and Turbine 9. The PSRA also expressly recognises that a collapse could range from a localised event to a major peat slide feeding into a watercourse.



Fig. 25: Typical Existing Drain Cut into Peat at the Site (Source: Appendix 8-2 Peat Stability Risk Assessment, Figure 7)

The PSRA risk registers for Turbine 8 and Turbine 9 are particularly relevant because both identify a distance from watercourse of less than 10m. The substation, BESS and Peat Deposition Area 1 risk registers also identify a distance from watercourse of less than 10m. These are key infrastructure elements, not peripheral works. The proximity of peat, excavations, deposition areas and electrical infrastructure to watercourses increases the importance of robust drainage design and sediment control.

While the applicant proposes mitigation through drainage systems, interceptor drains, culverts, monitoring, weather restrictions and geotechnical supervision, the effectiveness of these measures depends upon detailed design, correct installation, maintenance and rapid response during heavy rainfall events. In the context of a peatland and soft-ground site, sediment and peat disturbance should not be treated as conventional construction management matters. They are directly connected to water quality, ecology, downstream receptors and the integrity of the receiving environment.

7.6.8 Carbon and Peatland Policy Implications

The proposed development is advanced as a renewable energy project contributing to climate objectives. However, the climate benefits of wind energy do not remove the need to assess the carbon cost of peat disturbance, excavation, drainage, relocation, oxidation, forestry felling, concrete foundations, access tracks, borrow pits, BESS/substation infrastructure and grid connection works. Peat soils are carbon stores. Where peat is excavated, dried, relocated, drained or otherwise disturbed, there is potential for carbon release and loss of peatland carbon function.

The documents reviewed for this ground contain extensive discussion of peat excavation, reuse and stability, but they do not themselves provide a transparent carbon balance for the peat disturbance associated with the proposed development. The SPMP relies on circular economy language and proposes peat reuse within the site. However, reuse is not the same as avoidance. The peat management hierarchy identified in the SPMP itself places prevention first, followed by reuse, recycling/recovery/treatment and storage. The fact that substantial volumes of peat are proposed to be excavated and relocated means that the proposal does not fully avoid peat disturbance.

The GBWAG therefore submits that the Commission should require clear confirmation that the carbon implications of peat disturbance have been fully and transparently assessed within the wider climate assessment. Such assessment should specifically address peat excavation, peat relocation, borrow pit reinstatement, drainage changes, forestry felling, construction materials and the operational carbon payback period. It should also clearly reconcile the peat quantities used in the carbon assessment with the peat quantities stated in Chapter 8 and the SPMP.

In the absence of a transparent and reconciled peat carbon assessment, the Commission cannot be satisfied that the claimed climate benefits of the project have been assessed against the full carbon cost of development on peat and soft organic soils. This is particularly important where the project is proposed on lands already identified as unsuitable for wind energy development under the relevant Wind Energy Strategies and where peatland protection, biodiversity, hydrology and climate mitigation objectives overlap.

7.6.9 Inconsistencies and Uncertainty in the Applicant's Conclusions

The applicant's conclusions also require careful scrutiny. Chapter 8 states that following mitigation, the PSRA hazard ranking of the development is considered to be "low" for all areas. It then also states that the planning-stage PSRA indicates a "low" to "negligible" hazard ranking for instability related to excavations. By contrast, Table 7 of the PSRA states that all post-control measure risk ratings are "negligible". The distinction between "low", "low to negligible" and "negligible" should be clarified.

This may appear semantic, but it is material in the context of peat stability assessment. If the final position is that certain risks remain "low", then the EIAR should not present the project as wholly negligible risk following mitigation. If the final position is that all risks are negligible, then the Commission must understand precisely which mitigation measures are essential to achieving that conclusion and how those measures will be secured, verified and enforced.

The PSRA also records that the GSI landslide susceptibility mapping accounts only for current site topographic and hydrological conditions and is not intended to be used in isolation to determine actual on-site risk. It further notes that wind farm and BESS infrastructure can alter topographic and hydrological parameters in the temporary and/or permanent case. This is an important caveat. It means that the existing "low" landslide susceptibility mapping cannot be treated as determinative of construction-stage or operational-stage risk once the site is excavated, drained, loaded and altered by major infrastructure.

The GBWAG submits that the application relies too heavily on post-mitigation conclusions while giving insufficient weight to the applicant's own evidence of peat depth, observed sidewall instability, short-term excavation risk, proximity to watercourses, future temporary works requirements and the potential for major peat movement into watercourses in a worst-case event.

7.6.10 Conclusion on Peat, Soils and Land Stability

The applicant's own documentation confirms that peat, peaty soils, soft cohesive deposits, groundwater ingress, variable ground conditions, borrow pit excavation, floating roads, deep turbine excavations and significant peat/spoil relocation are all material features of the proposed development. The PSRA further confirms that peat excavations are likely to be unstable in the short term in the absence of mitigation, that sidewall collapse or spalling was encountered in the majority of trial pits where peat was present, and that the consequences of collapse could range from a localised event to a major peat slide feeding into a watercourse.

The GBWAG submits that these findings are not adequately reflected in the applicant's ultimate conclusion that residual effects on land, soils, geology and peat stability are not significant. The proposed development is only presented as acceptable through extensive reliance on mitigation, future detailed design, site-specific temporary works, contractor method statements, geotechnical supervision, monitoring, emergency response and ongoing management.

In these circumstances, the Commission cannot be satisfied that the proposed development would not give rise to unacceptable impacts on peat, soils, land stability, water quality and peatland carbon function. The application should be refused on this basis.

In the alternative, should the Commission be minded to grant permission, the GBWAG submits that strict conditions would be required, including:

- a reconciled peat and spoil balance;
- an updated peat depth survey prior to commencement;
- an independent review of the PSRA;
- a finalised Spoil and Peat Management Plan;
- detailed borrow pit and peat deposition design;
- a final design-stage PSRA identifying mitigation at each infrastructure location;
- independent geotechnical supervision during all relevant works;
- defined peat movement and settlement monitoring trigger levels;
- clear emergency response procedures;
- prohibition on peat storage near sensitive receptors, turbine perimeters or drainage pathways;
- updated carbon assessment addressing peat disturbance and relocation; and
- a requirement that no works commence until the Commission and relevant planning authorities are satisfied that the final construction methodology will not give rise to any greater or materially different environmental effects than those assessed in the EIAR.

In the absence of such certainty and safeguards, the proposed development is premature and inconsistent with proper planning, environmental protection and the precautionary approach required for development on peat and soft organic soils.

7.7 Ground 7: Hydrology and Water Quality: Insufficient Assessment and Unclear Mitigation (Appendix 4)

Our client raises serious concerns in respect of the adequacy of the hydrology, hydrogeology, peat stability, flood risk and water quality assessment submitted in support of the proposed development.

In summary, the specialist submission prepared by Pamela Bartley raises concerns regarding the applicant's Water Framework Directive baseline, flood risk assessment, surface water management measures, phosphorus and sediment risk, peat stability, hydrological connectivity, and the reliance placed on mitigation measures which may not be capable of functioning effectively under foreseeable flood and high-runoff conditions. Particular concern is raised in respect of the location of elements of the proposed development within Flood Zone A/B, the sensitivity of the Little Brosna River corridor, the presence of peat and cutover bog lands, and the potential for construction works, trenching, HDD, access tracks and drainage interventions to affect water quality and connected ecological receptors.

The specialist submission also raises concerns regarding the relationship between the Surface Water Management Plan, Flood Risk Assessment and Natura Impact Statement, and whether the application demonstrates the necessary level of certainty required to exclude adverse hydrological, water quality and European site effects.

Our client requests that An Coimisiún Pleanála have full regard to the specialist hydrology, hydrogeology, peat stability, flood risk and water quality submission enclosed at Appendix 4 when assessing the adequacy of the EIAR, NIS, Flood Risk Assessment, Surface Water Management Plan, CEMP, WFD assessment and supporting documentation.

For the avoidance of doubt, this section is intended to introduce and briefly summarise the specialist evidence prepared by Pamela Bartley. The detailed grounds of objection in respect of hydrology, hydrogeology, peat stability, flood risk and water quality are set out in full at Appendix 4.

7.8 Ground 8: Landscape and Visual Impact: Significant Adverse Effects and Inadequate Assessment (Appendix 5)

Our client raises serious concerns in respect of the adequacy of the landscape and visual impact assessment submitted in support of the proposed development. The proposed wind farm would introduce eleven turbines of up to 180 metres tip height, together with associated access tracks, hardstandings, substation, BESS infrastructure and grid-related works, into a sensitive rural receiving environment within the wider Birr / Little Brosna landscape.

Our client's concerns in respect of landscape and visual impact are addressed in detail in a separate specialist submission, which is enclosed at Appendix E to this report. That submission should be read as forming part of this objection and appeal submission.

By way of summary, the specialist submission raises concerns regarding the adequacy and representativeness of the applicant's photomontages and viewpoints, the potential underrepresentation of effects from sensitive residential, community, heritage and scenic locations, the scale and skyline prominence of the proposed turbines, the visual

dominance of certain turbines, and the cumulative landscape and visual effects arising in combination with existing and permitted wind energy development in the wider area.

The client group is particularly concerned that the proposed development would result in a material industrialisation of the local rural landscape and would adversely affect the visual amenities, rural character and wider landscape setting of the area. The scale of the turbines is such that the proposed development would be highly visible from a range of local receptors and would introduce prominent moving infrastructure into views currently experienced as rural, open and relatively undeveloped.

The client group is further concerned that the landscape and visual assessment may understate the significance of the effects by relying on selected viewpoints, technical classifications and cumulative assessment conclusions which do not adequately reflect the lived experience of local residents or the sensitivity of the receiving environment. This is particularly relevant where the lands are located within an area identified as unsuitable for wind energy development under the relevant Development Plan framework.

Our client therefore requests that An Coimisiún Pleanála have full regard to the specialist landscape and visual impact submission enclosed at Appendix 5 when assessing the adequacy of the EIAR, photomontages, viewpoint selection, cumulative visual assessment and landscape impact conclusions. In the event of any conflict between the applicant's conclusions and the specialist submission, our client submits that a precautionary and plan-led approach should be adopted.

For the avoidance of doubt, this section is intended to introduce and cross-reference the specialist landscape and visual impact evidence enclosed at Appendix 5. The detailed grounds of objection in respect of landscape and visual impact are set out in full at Appendix 5.

7.9 Ground 9: Traffic, Access and Grid Connection: Unsuitable Infrastructure and Safety Concerns

The proposed development gives rise to significant concerns in relation to traffic, access, road safety, abnormal load delivery, grid connection works and the suitability of the local road network to accommodate the scale and nature of the construction activity proposed. While the applicant has submitted a Traffic and Transportation chapter, a Traffic Management Plan and a Grid Connection Construction Methodology, the GBWAG submits that these documents do not provide a sufficiently robust or certain basis upon which the Commission can conclude that the proposed development would not give rise to unacceptable impacts on road users, local residents, rural road infrastructure, schools, emergency access and the wider receiving environment.

The concern is not confined to ordinary construction traffic volumes. The proposed development comprises 11 no. wind turbines, a 110kV substation, Battery Energy Storage System, borrow pits, internal access roads, construction compounds, turbine foundations, hardstanding areas, a 12.23km underground grid connection route and works to accommodate turbine delivery. The traffic and access implications of the development must therefore be assessed as an integrated project, rather than as a series of isolated or temporary construction activities.

The applicant's own Traffic and Transportation chapter acknowledges that the construction phase constitutes the critical period with potential to affect the surrounding road network. It further acknowledges that these effects arise both from temporary increases in traffic volumes and from the specific geometric requirements necessary to accommodate Abnormal Indivisible Loads associated with delivery of turbine components. This is a material acknowledgement. The proposed development is dependent upon the ability of a rural and regional road network to accommodate heavy construction vehicles, abnormal turbine loads, temporary road works, grid trenching, diversions, road closures, overhead clearance checks, site access movements and road reinstatement works over an extended construction period.

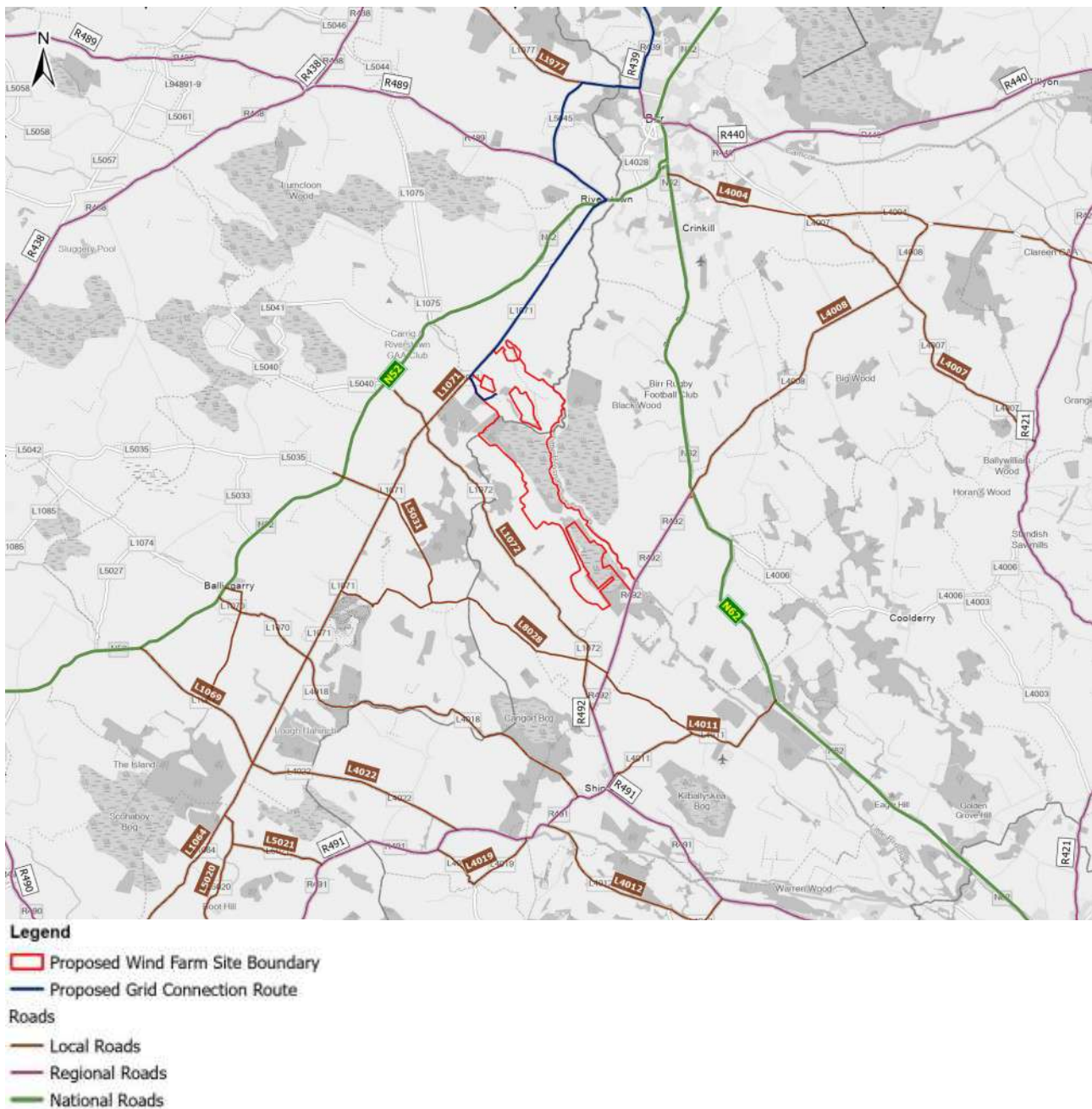


Fig. 26: Site Location at Local Level (Source: EIAR Chapter 14, Figure 14-2)

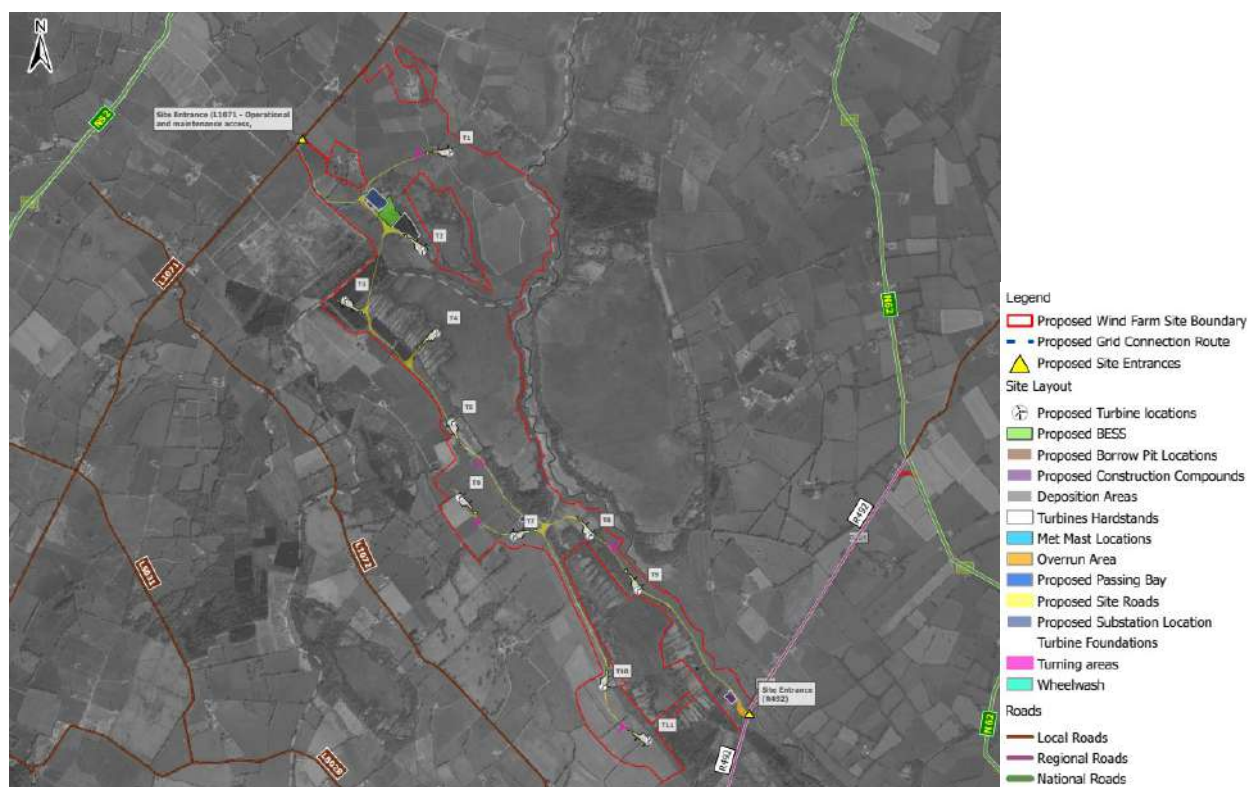


Fig. 27: Site Entrances (Source: EIAR Chapter 14, Figure 14-4)

7.9.1 Limited Scope of the Traffic Assessment

The GBWAG submits that the traffic assessment adopts an unduly narrow approach when assessed against the full scale and geographic spread of the proposed development. The applicant's assessment focuses principally on construction traffic impacts at the N62/R492 crossroads and the R492 site access location. The L1071 access is not assessed in detail on the basis that the R492 access point will be the only construction-phase access suitable for construction vehicles. However, this does not fully address the wider traffic and access implications of the proposed development.

The project is not limited to the R492 site entrance. The grid connection route runs for approximately 12.23km from the proposed on-site substation to the existing Dallow 110kV substation, with the majority of the route located within the public road network. The route affects the L1071, N52, R489, L5045, L1077, R439 and L70152, and passes through or near sensitive locations including Riverstown, Killeen National School, the Croghan Road approach to Birr, the Little Brosna River crossing, Eden Road / Banagher Road and the approach to Dallow substation. The traffic and access effects of these works cannot be adequately captured by a traffic assessment focused primarily on two junctions associated with the main construction haul route.

The applicant's own documents confirm that the grid connection works will involve temporary road works, rolling lane closures, stop/go systems, full closures at certain locations, diversions and road opening licences. It is therefore submitted that the assessment should have included a more detailed route-by-route and junction-by-junction appraisal of the grid connection route, including local road widths, junction constraints, school access, dwelling access, agricultural access, emergency access, pedestrian/cyclist safety, road condition and the practical consequences of road closures in a rural road network with limited alternative routes.

The GBWAG further notes that the Traffic and Transportation chapter records the traffic count locations by reference to "Error! Reference source not found." This may be a drafting or formatting issue, but in the context of a major infrastructure proposal relying on detailed traffic survey locations and assumptions, such presentation errors do not assist transparency. Affected residents and third parties should be able to clearly identify where surveys were undertaken, what routes were assessed, what routes were not assessed, and how the applicant's conclusions were reached.

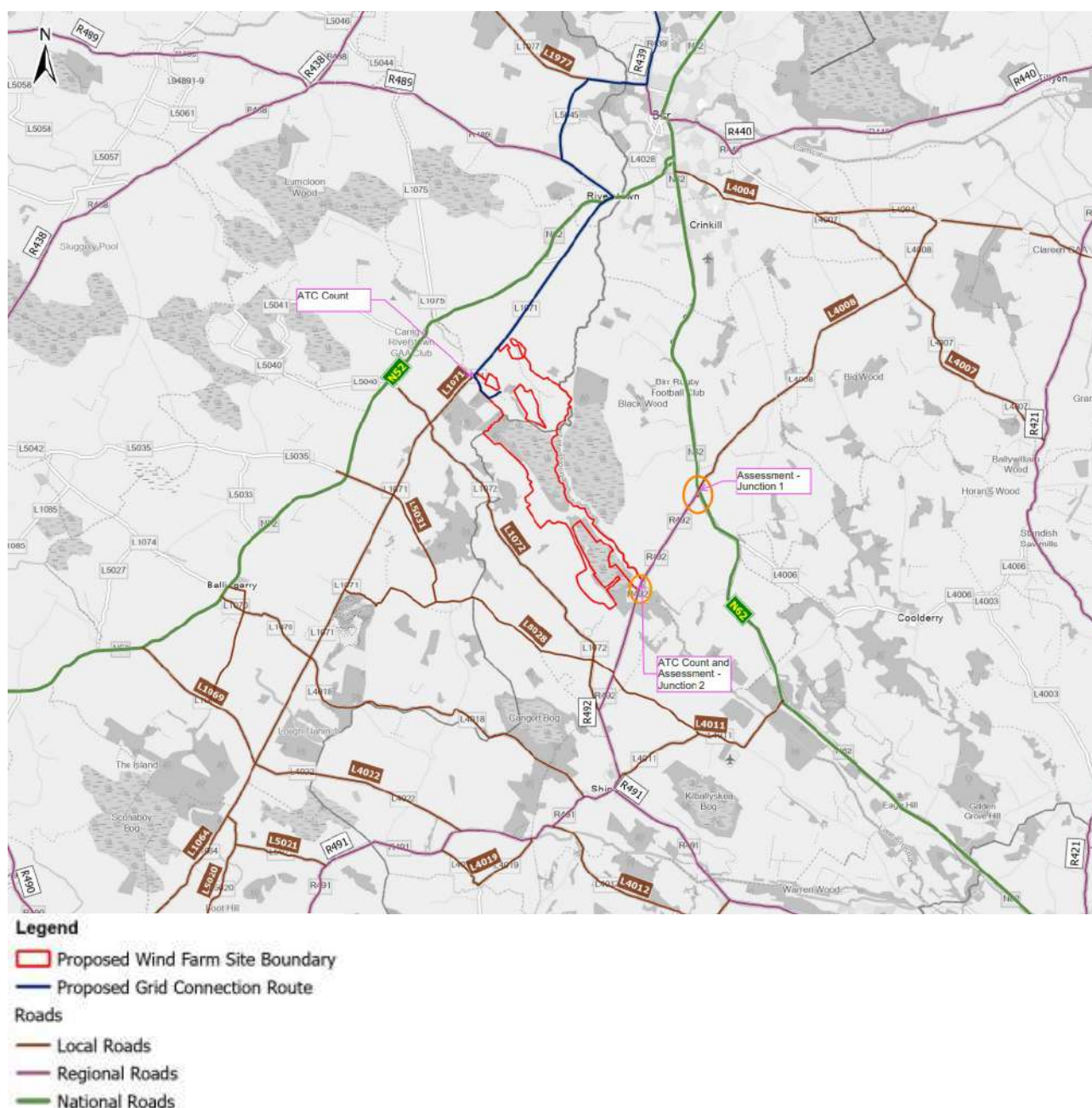


Fig. 28: Assessment Junctions Source: EIAR Chapter 14, Figure 14-3.

7.9.2 Construction Traffic Volumes and Uncertain Trip Generation Assumptions

The applicant's own assessment confirms that construction traffic will be substantial, particularly during peak construction periods and turbine foundation concrete pours. Chapter 14 identifies a construction period of approximately 24 months, with overlapping phases including civils, grid connection/substation/BESS works, site electrical works, turbine deliveries and erection, and commissioning. It further identifies a peak construction period during which site compounds, internal access roads, turbine hardstands and turbine foundations are expected to occur simultaneously.

Chapter 14 states that peak construction traffic, excluding concrete pour volumes, is estimated at a maximum of 27 daily one-way heavy vehicle movements, with an average of 15 heavy vehicles during off-peak periods. It also states that concrete turbine foundation pours require continuous single-day pours, resulting in 93 heavy vehicles arriving on site per day, equivalent to approximately 9 heavy vehicles arriving per hour during concrete pours. These are significant vehicle movements on rural and regional roads, particularly when considered alongside staff traffic, normal road users, agricultural traffic, school traffic and other local activity.

The GBWAG is concerned that the assessment presents these impacts as manageable primarily because existing baseline traffic volumes are low. Low baseline traffic volumes should not be treated as a proxy for road suitability. In a rural context, low traffic volumes often correspond with narrow carriageways, limited hard shoulders, constrained verges, bends, limited pedestrian facilities, agricultural entrances, roadside dwellings and reduced capacity for safe two-way HGV passing. The

question is not simply whether the junctions have spare numerical capacity, but whether the roads are physically and safely suitable for the type, intensity and duration of traffic proposed.

There also appear to be discrepancies between the traffic generation assumptions presented in Chapter 14 and the Traffic Management Plan. Chapter 14 states that approximately 120 staff are estimated at peak construction, with 76 people estimated during off-peak activities, and assumes that all staff arrive by light vehicles with an occupancy of one person per vehicle. By contrast, the TMP states that peak construction includes activities such as establishment of compounds, site roads, turbine hardstands and foundations, with up to 120 staff on site per day and an average daily workforce of approximately 76 personnel. However, the TMP then states that during peak construction activities approximately 76 personnel will be present on site and assumes an average occupancy of two persons per vehicle. The TMP further refers to different HGV movement assumptions from those identified in Chapter 14.

This inconsistency should be clarified. Trip generation is central to the assessment of road impact, road safety, construction disturbance and cumulative traffic effects. If the peak workforce is 120 persons, the traffic generation should be assessed on that basis. If a different vehicle occupancy is relied upon, it should be justified and secured by enforceable measures. Similarly, if the assessment assumes that concrete pours will not coincide with other significant deliveries, this should be secured by condition and subject to clear monitoring and enforcement.

The GBWAG further submits that the assumption that only 20% of construction traffic will access and leave the site during peak periods may understate potential effects if construction programming, weather windows, concrete pour requirements, contractor logistics or delivery constraints cause higher peak-hour movements in practice. This is particularly relevant given that the TMP is expressly to be updated following contractor appointment and final construction programming.



Fig. 29: Construction Programme Heavy Vehicle Volumes (Source: EIAR Chapter 14, Table 14-4 and Figure 14-7)

7.9.3 Suitability of the R492 Main Construction Access

The R492 is identified as the main site access and egress point during the construction phase. The applicant states that this is the only suitable access point on the existing road network to accommodate construction vehicles. The R492 is therefore critical to the feasibility and safety of the construction phase.

The applicant describes the R492 as a single carriageway regional road which accommodates two-way traffic, has a speed limit of 80km/h, is relatively narrow, has limited hard shoulders and contains several bends typical of rural roads in the area. These characteristics are materially relevant. The R492 is not a purpose-built industrial access road. It is a rural regional road which will be required to accommodate HGV movements, construction staff traffic, concrete deliveries, turbine delivery movements, abnormal load access, turning manoeuvres, visibility splay maintenance, wheel wash operations and traffic management controls.

The applicant states that visibility at the R492 access can be achieved and that a temporary advisory speed limit will be implemented during the construction phase, with 85th percentile speeds monitored prior to opening the construction access. It is further stated that a Traffic Management Operative will be stationed at the entrance to ensure safe egress onto the R492. The GBWAG submits that this demonstrates that safe operation of the access is not simply inherent in the existing road environment, but depends on active traffic management, speed monitoring, vegetation maintenance and operational supervision.

The reliance on a temporary advisory speed limit is of particular concern. An advisory speed limit is not equivalent to a permanent design solution. If the safe functioning of the construction entrance depends on traffic speeds being reduced, the Commission should require clear evidence as to how this will be implemented, enforced and monitored. Similarly, if

visibility splays depend on ongoing hedgerow maintenance within the applicant's control, strict conditions would be required to ensure that visibility is maintained at all times throughout the construction phase.

The GBWAG further submits that the assessment should be supplemented by a more detailed appraisal of the R492 between the N62/R492 junction at Sharavogue and the proposed site entrance, including carriageway width, verge condition, forward visibility, bend alignment, roadside dwellings, agricultural accesses, pedestrian/cyclist use, road edge condition and the potential for conflict between construction vehicles and ordinary rural traffic. In the absence of such route-specific detail, the conclusion that the R492 can safely accommodate the proposed traffic is not sufficiently robust.

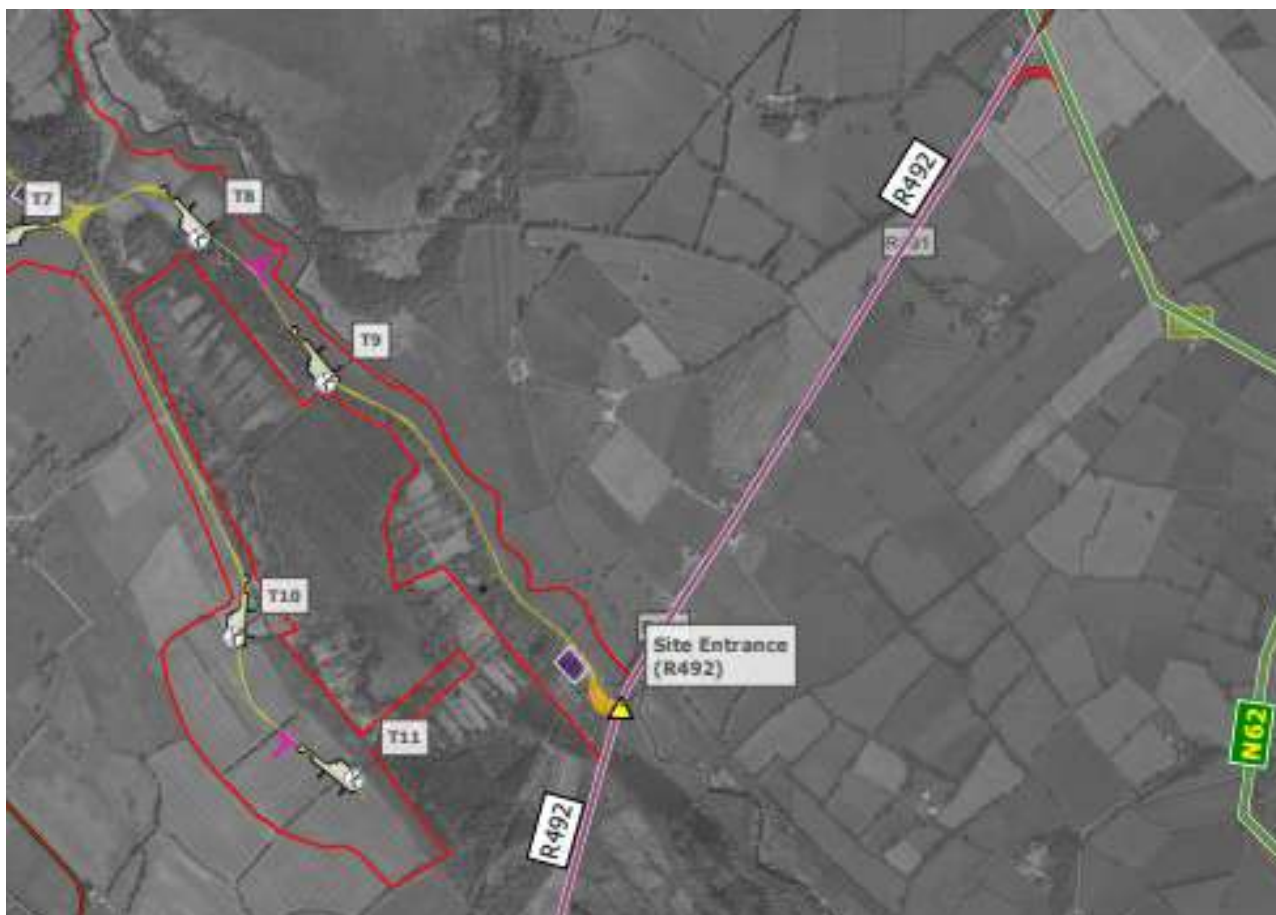


Fig. 30: Proposed Main Construction Access from R492 (Source: EIAR Chapter 14, Figure 14-4)

7.9.4 Abnormal Indivisible Loads and Turbine Delivery Route Constraints

The delivery of turbine components represents a distinct and significant traffic and safety issue. The proposed turbines require the transport of blades, tower sections, nacelles and associated components as Abnormal Indivisible Loads. Chapter 14 confirms that AIL deliveries will be transported in convoys of 3 to 5 components per convoy and that AIL traffic has not been included in the traffic impact percentage increase because such deliveries are proposed to take place at night, under traffic control measures and with Garda escort.

The GBWAG submits that the exclusion of AIL traffic from the quantitative traffic percentage increase should not result in the underassessment of its practical traffic and road safety implications. AIL movements may be low in numerical volume, but they have a disproportionate impact due to their size, turning requirements, convoy nature, traffic control requirements, potential delays, road occupation, oversailing, temporary works and interaction with roadside infrastructure.

The applicant's own assessment identifies multiple pinch points along the turbine delivery route where works are required to accommodate the passage of turbine components. These works include demounting signage, removal of lighting columns/electric poles, installation of temporary hardstanding, pruning of vegetation, oversail areas and a new temporary offline access track to provide adequate turning radii for abnormal loads accessing the R492. This demonstrates that the road network is not naturally suitable for the turbine delivery requirements without temporary alteration.



Legend

-  Wind Farm Site Boundary
 Turbine Delivery Route
 Proposed Grid Connection Route
 Roads
 Regional Roads
 National Roads
 Motorways

Fig. 31: Abnormal Indivisible Load Delivery Route / Turbine Delivery Route (Source: EIA/R Chapter 14, Figure 14-6)

The applicant states that all required road opening licences, agreements with Local Authorities and An Garda Síochána will be sought by the appointed contractor in a timely manner. The TMP similarly states that the appointed contractor and haulage provider will be responsible for obtaining permissions, licences and approvals prior to transport. The GBWAG submits that this demonstrates a significant reliance on future third-party approvals and contractor-led planning. While such approvals may be required as a matter of process, they do not remove the Commission's obligation to assess at consent stage whether the turbine delivery route is suitable and whether the traffic and safety impacts are acceptable.

A further concern arises from the applicant's own acknowledgement that the current planning application includes the proposed temporary works required for turbine delivery within third-party privately owned lands at Sharavogue Crossroads, while a further consenting process will be used to obtain permission for other temporary works areas along the route within the public road corridor. The GBWAG submits that this raises a project-splitting and certainty concern. The physical delivery of turbine components is integral to the proposed development. If temporary works are required along the public road corridor to enable delivery, the Commission should be satisfied that those works have been fully assessed and that any environmental, traffic, safety and land-use effects associated with them are before the Commission at application stage.

The AIL delivery strategy also relies on night-time movements to reduce interaction with general traffic. While this may reduce traffic volumes encountered, it does not eliminate impacts. Night-time AIL movements introduce their own safety considerations, including reduced visibility, driver fatigue, disturbance to residents, noise from convoys and escorts, temporary removal of signage, temporary traffic control, and the potential for disruption at sensitive locations. These impacts should be assessed as real operational consequences of the proposed development rather than treated as automatically mitigated by timing and Garda escort.

7.9.5 Grid Connection Route Impacts on Local Roads, Residents and Community Facilities

The proposed grid connection route is one of the most significant traffic and access issues arising from the application. The GCR is approximately 12.23km in length and will run from the proposed 110kV substation to the existing Dallow 110kV substation. The majority of this route is located within the public road network, including local, regional and national roads. The route includes approximately 10.23km within the road network and approximately 2.10km off-road.

The applicant's documents confirm that the GCR will affect the L1071, N52, R489, L5045, L1077, R439 and L70152. The route includes local roads, sections within or approaching Birr, Riverstown, Killeen National School, Croghan Road, the Little Brosna River crossing, Banagher Road and the Dallow substation access. The works will involve open trenching, joint bays, link boxes, communication chambers, HDD crossings, road reinstatement, service crossings, watercourse/culvert crossings and traffic management.



Fig. 32: Grid Connection Route Overall Location (Source: Appendix 2-5 Construction Methodology Report, Figure 2.1)

Description	Route Length
National Roads	0.16 km
Regional Roads	3.64 km
*Local Primary Roads	4.78 km
Local Secondary Roads	1.65 km
Total Road Network	10.23 km
*Private Lands (Including ESBN Dallow Substation Site)	2.10 km
Total Off Road Network	2.10 km
Total Route Length	12.23 km

Table 6: Grid Connection Route Summary (Source: Appendix 2-5 Construction Methodology Report, Table 2.1)

Ref	Section Description	Route Length
Section 1	Wind Farm Substation joining to L-1071 from Cronekill to the junction with N-52	4.745 km
Section 2	The junction of L-1071 with N-52 to the junction of R-489 with L-5045 Killeen	1.43 km
Section 3	The junction of the R-489 with L-5045 Killeen to the Bridge 6 over on the L-1077 Croghan Road	2.43 km
Section 4	Birr Town inside the 50 km/h zone	1.045 km
Section 5	R- 439 Cappaneale Upper to just before the junction of the L-70152	1.7 km
Section 6	Just before the junction of the L-70152 to Dallow 110 kV Substation	0.88 km
Total		12.23 km

Table 7: Section Breakdown (Source: Appendix 2-5 Construction Methodology Report, Table 2.2)

The applicant confirms that the grid connection works will require temporary road closures of local roads and temporary lane closures of regional roads for trenched crossings. The EIAR and TMP identify specific sections where full closure may be required, including sections of the L1071 and L5045. Section 5 of the route is particularly sensitive because it runs along the L5045 past Killeen National School, where full closure may be needed at points and diversions may be required. The GBWAG submits that this requires a more detailed and location-specific assessment of school access, school drop-off and collection times, pupil safety, pedestrian/cyclist safety, bus or school transport movements and the practical implications for residents and parents.

The route also passes through or adjacent to constrained heritage and watercourse locations. The grid connection methodology confirms that the route avoids an NIAH protected bridge on the N52 by off-road HDD, and crosses the Little Brosna River by HDD within private lands north of Croghan Bridge. It also identifies multiple culverts, stormwater pipes, watercourse crossings and utility/service constraints along the route. These are not merely traffic matters; they demonstrate that the grid connection is routed through a constrained environment where road, heritage, water, utility and access considerations overlap.

The applicant states that progress of grid connection cabling will be approximately 250m per week, with no more than 100m of trench open at any one time. The Construction Methodology indicates that typical installation of a 100m section may take approximately two days, with cable pulling and jointing works taking additional time. Joint bays are proposed at intervals along the route and may require re-excavation during cable installation and jointing. The GBWAG submits that the impact on local road users should therefore not be assessed simply as a moving minor works area. Residents may experience repeated disruption at different stages, including preliminary investigations, trenching, ducting, temporary reinstatement, joint bay works, cable pulling, jointing, permanent reinstatement and any remedial works.

The Construction Methodology also states that joint bays are typically 2.6m x 6m x 1.75m pre-cast concrete structures installed below finished ground level, and that where possible joint bays will be located in the non-wheel-bearing strip of roadways, but that given the narrow profile of local roads this will not always be possible. This is a significant acknowledgement. It indicates that the local road network may be too narrow in places to accommodate joint bays outside wheel tracks, thereby increasing the potential for traffic disruption, road integrity issues, reinstatement concerns and long-term maintenance complications.

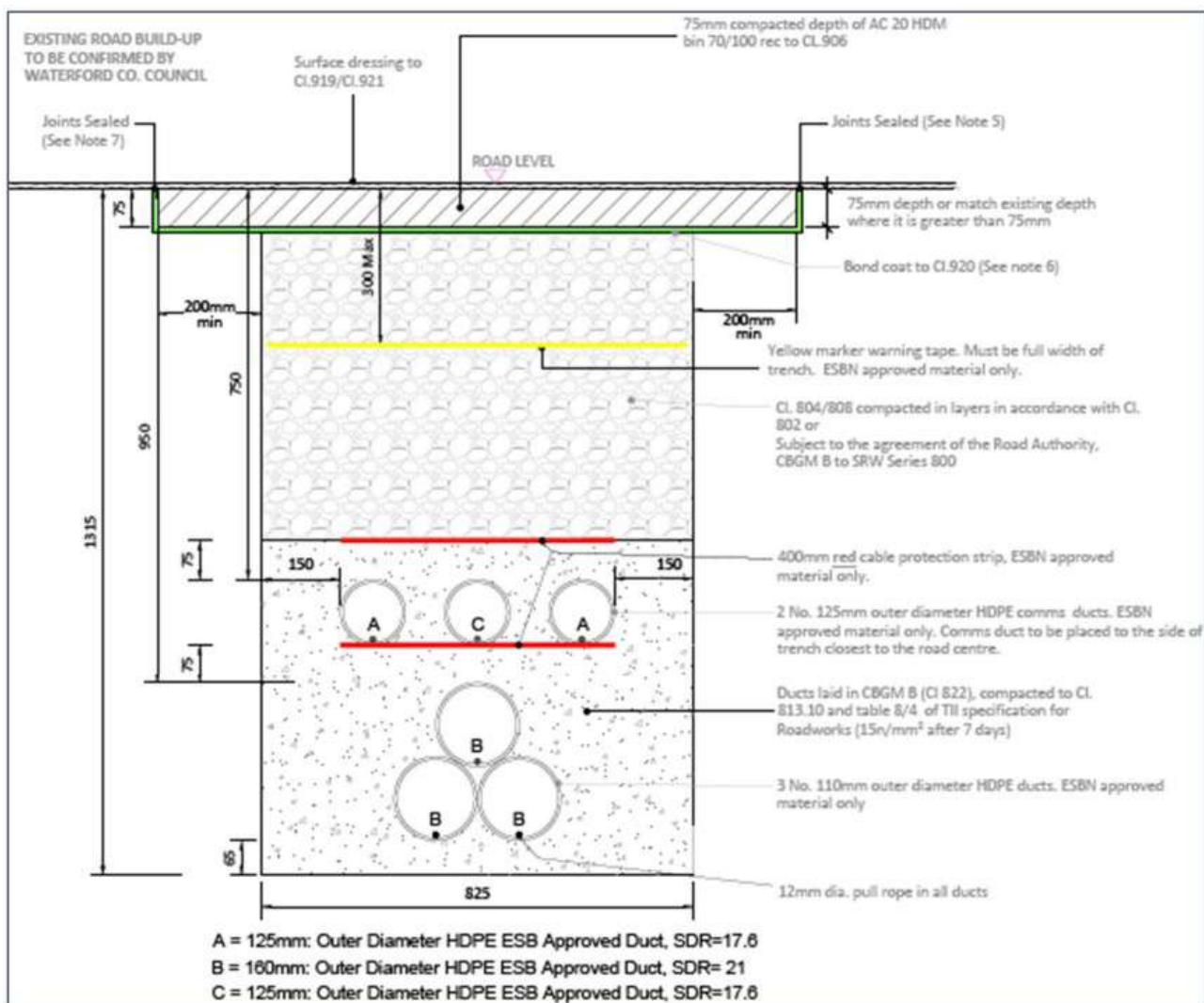


Fig. 33: Typical Trench in Roadway (Source: Appendix 2-5 Construction Methodology Report, Figure 8.2)

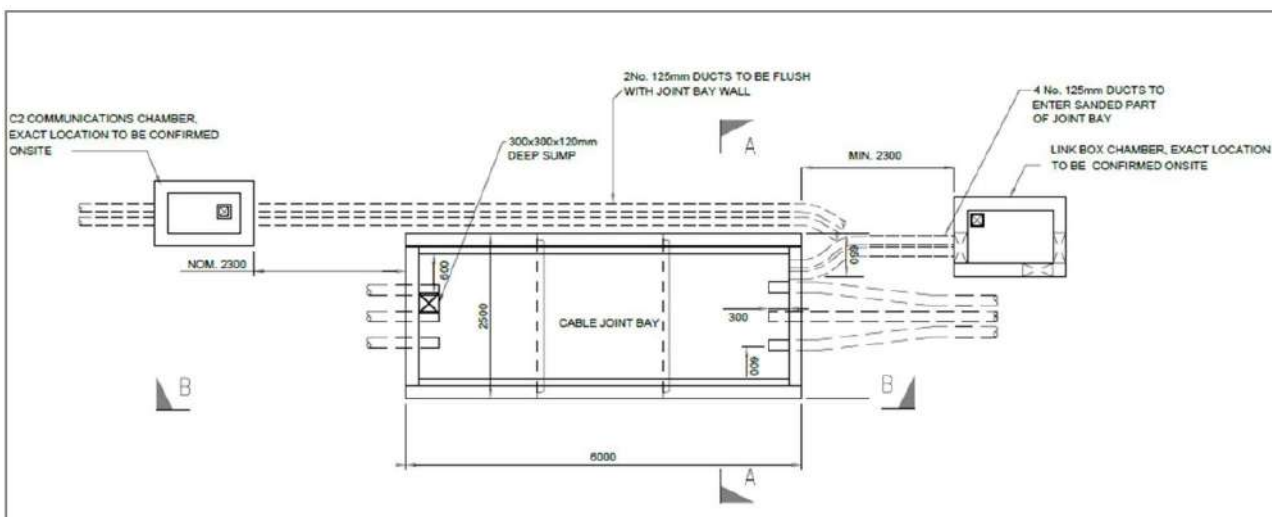


Fig. 34: Typical Joint Bay and Link Box Plan Layout (Source: Appendix 2-5 Construction Methodology Report, Figure 8.5)

7.9.6 Reliance on Future Road Opening Licences, Contractor Method Statements and TMP Updates

A central concern is the degree to which the traffic, access and grid connection impacts are deferred to post-consent processes. The Traffic Management Plan expressly states that it is a "live document" and that it has been prepared prior to the appointment of a contractor, material suppliers and final construction phase programme. It further states that the TMP will be updated following grant of planning permission and prior to commencement of any construction works.

The Grid Connection Construction Methodology similarly states that it is in outline form only and will be revised and updated prior to commencement of construction activities, with detailed method statements to be prepared for each aspect of the development. It further states that preliminary site investigations will be required along the cable route prior to construction to confirm design assumptions, including slit trenches at service crossings, trial holes along the route, trial holes at potential joint bay positions and trial/boreholes at HDD launch and reception pit locations.

The GBWAG submits that this degree of post-consent refinement is material. The Commission is being asked to grant permission for a major wind farm and grid connection where key aspects of traffic management, road closures, diversion routes, service interactions, HDD design, joint bay siting, contractor methods, delivery scheduling and traffic controls remain to be confirmed after permission. That is particularly problematic in a rural road environment where road widths, school access, emergency access, dwelling access, agricultural movements, watercourse crossings and utility constraints are critical to the acceptability of the works.

The application repeatedly states that matters will be agreed with Offaly County Council, Tipperary County Council, An Garda Síochána, Roads Authorities, ESB/EirGrid, statutory providers and other stakeholders at a later stage. While ongoing liaison is necessary, it is not a substitute for a complete and robust assessment at application stage. The Commission must be satisfied now that the proposed development can be constructed and operated without unacceptable traffic, road safety or access impacts. It should not be left to future road opening licences, temporary traffic management approvals or contractor method statements to resolve issues that go to the principle and acceptability of the development.

The GBWAG also notes that the TMP states that further commitments may be developed during the construction phase in consultation with stakeholders. This again reinforces the extent to which the traffic mitigation strategy is not finalised. In EIA terms, mitigation relied upon to support a conclusion of no significant effect must be sufficiently specific, certain, enforceable and capable of implementation. A live TMP and outline methodology do not provide the same level of certainty as a finalised, independently verified traffic and access strategy.

7.9.7 Road Closures, Diversions and Emergency Access

The proposed grid connection works will require road closures and diversions along multiple sections of the local road network. The EIAR and TMP identify potential diversions of 5.9km, 2.1km, 4.6km, 3.7km, 4.9km, 2km and 7.1km across various sections of the route. These diversions may be described as temporary, but they have real consequences for local residents, farmers, school traffic, businesses, emergency services and ordinary road users.

In a rural context, a diversion of several kilometres may significantly affect journey times, emergency response routes, school access, agricultural movements and access to local services. The application states that local access will be maintained, that closures will be carried out outside peak traffic flow times, and that the appointed contractor will consult with the Roads Authority, An Garda Síochána and emergency services to agree suitable diversion routes. However, the GBWAG submits that this is not a sufficient assessment of the practical consequences of such closures.

The Commission should require clear confirmation of which roads may be fully closed, the maximum duration of closures, the precise diversion routes, whether diversions are suitable for all vehicle types including agricultural vehicles and emergency vehicles, how school access will be maintained, how residents will be notified, how vulnerable road users will be protected, and how simultaneous works will be prevented from creating cumulative disruption. Without such information, the conclusion that impacts will be temporary and not significant is not adequately supported.

The Construction Methodology states that in the event of emergency, steel plates can be put in place across excavations to allow traffic to flow on both sides of the road. While this is a useful contingency measure, it also highlights that emergency access depends on site-specific response and construction-stage management. The GBWAG submits that emergency access should be assessed and secured in advance, not simply managed reactively once works are underway.

7.9.8 Road Condition, Reinstatement and Long-Term Maintenance

The proposed development would impose a significant construction burden on rural roads, including HGV traffic, concrete deliveries, abnormal load movements, grid trenching, joint bay construction, temporary reinstatement and permanent reinstatement. The TMP proposes pre- and post-construction road condition surveys and road sweeping, and the applicant states that road reinstatement will be undertaken in accordance with relevant standards and local authority requirements.

The GBWAG submits that road condition and reinstatement require careful scrutiny. The grid connection involves a lengthy trench through the public road network, with standard trenches of approximately 825mm width and 1,315mm depth, together with joint bays, link boxes and communications chambers. In narrow local roads, trenching and joint bay installation can affect carriageway integrity, drainage, edge stability, road camber and long-term pavement performance. Temporary reinstatement may also create safety issues if not properly maintained.

The applicant's own Grid Connection Construction Methodology states that where joint bays are located under the road surface, the joint bay will be backfilled and the road surface temporarily reinstated as specified by the local authority. It also acknowledges that joint bay locations and associated chambers are subject to ESBN/EirGrid approval. The GBWAG submits that the Commission should not rely on generic reinstatement commitments without requiring detailed condition

surveys, agreed reinstatement standards, independent verification and post-construction monitoring over a defined period.

The potential for road deterioration is not limited to the grid route. The R492 and construction haul routes will carry repeated HGV movements, including stone, aggregate, concrete, construction plant, BESS/substation materials and other deliveries. The TMP states that road surveys will be undertaken before and after construction, with timing and scope to be agreed with the local authorities. The GBWAG submits that this should be strengthened into a binding requirement for pre-construction, during-construction and post-construction road condition monitoring, with the developer responsible for repair of all damage attributable to construction traffic.

7.9.9 Cumulative and Community Effects

The applicant's assessment places substantial reliance on the temporary nature of construction impacts. However, the construction period is approximately 24 months and the grid connection, turbine delivery works, road works, concrete pours, HGV deliveries, AIL movements and internal access works may occur at different stages and locations. For affected residents, the cumulative experience may involve repeated disruption rather than a single temporary event.

This is particularly relevant where the same rural community may experience construction haulage on the R492, abnormal load preparation and delivery, grid connection works on local roads, road closures/diversions, night-time turbine deliveries, road cleaning, construction signage, temporary speed limits, traffic management operatives, and ongoing communication with contractors. The applicant's conclusion that impacts are temporary does not fully capture the cumulative burden imposed on residents, road users and the local rural environment over the construction period.

The GBWAG further submits that the proposed development may affect vulnerable road users including pedestrians, cyclists, school children, elderly residents and local recreational users. Rural roads in the area may not have footpaths, cycle facilities or hard shoulders. The presence of HGVs, construction traffic, temporary traffic management and road closures may therefore have a disproportionate impact on perceived and actual safety, even where numerical traffic capacity remains available.

7.9.10 Conclusion on Traffic, Access and Grid Connection

The applicant's own documentation confirms that the proposed development would require substantial use of the rural and regional road network, including construction traffic, heavy vehicle movements, concrete pours, abnormal load deliveries, temporary road works, grid connection trenching, joint bay construction, road closures, diversions, HDD works, road opening licences and ongoing traffic management.

The GBWAG submits that the assessment does not provide a sufficiently certain or comprehensive basis upon which the Commission can conclude that the proposed development would not give rise to unacceptable traffic, access or road safety impacts. In particular, the assessment is deficient in the following respects:

- The traffic assessment is focused primarily on a limited number of assessment junctions and does not provide a sufficiently detailed route-specific assessment of the full grid connection route, local roads, school access, dwelling access and emergency access.
- The assessment relies heavily on low baseline traffic volumes to infer available capacity, without adequately addressing the physical suitability of narrow rural roads for HGVs, AILs, trenching works, road closures and joint bay construction.
- There are apparent inconsistencies in staff and vehicle trip generation assumptions between Chapter 14 and the TMP which require clarification.
- The AIL delivery strategy depends on temporary works, oversailing, signage removal, lighting/electric pole removal, vegetation pruning, temporary hardstanding, a temporary offline access track, night-time deliveries, Garda escort and future licences/agreements.
- The grid connection route will require extensive works within the public road network, including potential full closures, stop/go systems, diversions, joint bays, service crossings, watercourse/culvert crossings and future road opening licences.
- The TMP and Grid Connection Construction Methodology are not finalised documents and rely on post-consent contractor appointment, future surveys, detailed method statements, road opening licences, local authority agreement and further stakeholder consultation.

In these circumstances, the GBWAG submits that the Commission cannot be satisfied that the proposed development has been adequately assessed in traffic, access, road safety and grid connection terms. The proposed development should be refused on this basis.

In the alternative, should the Commission be minded to grant permission, the GBWAG submits that strict conditions would be required, including a final Construction Traffic Management Plan, independent Road Safety Audit of all site access and

grid route works, confirmed diversion routes, school-specific traffic management measures for Killeen National School, a prohibition on HGV movements during school opening and closing periods, finalised AIL swept path drawings and permissions, full pre- and post-construction road condition surveys, developer-funded road repairs, emergency access protocols, advance resident notification, independent monitoring of traffic controls, clear complaint procedures and confirmation that all grid connection works remain within the assessed environmental envelope.

7.9.11 Expert Submission (See appendix 6)

Our client raises significant concerns regarding the adequacy of the Roads, Traffic and Transportation assessment submitted in support of the proposed development. In particular, concerns arise in respect of the capacity and safety of the local and regional road network, the suitability of the proposed turbine delivery route, the cumulative impacts of heavy construction traffic and grid connection works, abnormal indivisible load (AIL) movements, rolling road closures, bridge capacity, junction safety, and the likely effects on local communities, agricultural operations and daily road users. The submission also identifies concerns regarding the interaction of the proposed development with other major infrastructure projects in the area, including the proposed Shannon Pipeline.

A detailed independent review of the applicant's Roads, Traffic and Transportation assessment has been prepared by members of the local community and is enclosed at Appendix 6 to this report. The specialist submission should be read as forming part of this objection and addresses, inter alia, deficiencies in the applicant's traffic assessment, road safety, abnormal load routing, cumulative impacts, construction traffic management, grid connection works, bridge capacity, visibility splays, and the adequacy of the proposed mitigation measures.

Accordingly, our client respectfully requests that An Coimisiún Pleanála have full regard to the Roads, Traffic and Transportation submission contained at Appendix 6, together with its conclusions and recommendations, when assessing the likely effects of the proposed development on the local and regional road network, public safety and residential amenity.

7.10 Ground 10: Over-Reliance on Post-Consent Mitigation and Monitoring

A further concern arising from the application is the extent to which the acceptability of the proposed development is dependent upon mitigation measures, management plans, monitoring regimes and detailed methodologies to be developed, updated or implemented after consent. While the GBWAG accepts that construction management plans and environmental monitoring are commonly used in infrastructure projects, such measures cannot be used to remedy deficiencies in the baseline assessment or to defer critical environmental assessment to the post-consent stage.

The applicant's own documentation demonstrates that this is not a case where post-consent measures are confined to minor construction administration. Rather, the Construction Environmental Management Plan expressly states that it is a "live" document which will evolve during the project and be subject to review to address planning conditions, best practice at the time of construction, pre-construction site investigations, changes arising from contractor construction methods and unforeseen conditions. The CEMP further states that the appointed Main Contractor will have responsibility for updating the document through the construction phase and that further details will be included later, including emergency plan details, site and traffic signage and method statements.

This is a material issue in the present case because the proposed development is located within a sensitive rural and environmental context, includes substantial turbine infrastructure, peat and spoil management, borrow pits, BESS infrastructure, grid connection works, watercourse crossings, turbine delivery works, forestry felling and extensive construction activity. The application therefore requires a high degree of certainty at consent stage as to how impacts will be avoided, reduced and controlled.

Chapter 20 of the EIAR reinforces the concern. The Schedule of Mitigation states that the CEMP will be updated prior to commencement to address planning conditions and will be regularly reviewed and updated during the course of the works. It also confirms that implementation will be the responsibility of the construction contractor and overseen by environmental, ecological, archaeological and geotechnical personnel. In addition, the Traffic Management Plan is described as a living document to be updated ahead of construction, while a number of ecological measures rely on pre-construction surveys, future invasive species plans, future verification, ECoW supervision and monitoring.

The same pattern is evident in relation to peat and land stability. The Peat Stability Risk Assessment recommends a design-stage PSRA, detailed drainage design, hydrological assessment of stream flows, a monitoring regime for peat movement, identification of areas requiring site-specific temporary works design, additional site investigations in specific risk areas, updated risk registers, contractor method statements, geotechnical supervision and emergency / unforeseen event plans. These are not merely administrative matters. They relate directly to the ability of the development to be constructed safely and without adverse effects on peat stability, water quality and downstream receptors.

The GBWAG submits that the cumulative reliance on these future measures creates an unacceptable degree of uncertainty. The Commission is being asked to accept that significant environmental matters can be adequately controlled through documents and methodologies which will be amended, expanded, agreed or implemented after permission is granted. This approach is particularly problematic where the applicant's own assessments already identify sensitive receptors, peat and soft ground conditions, watercourse proximity, ecological constraints, traffic disruption, shadow flicker exceedances, noise constraints and reliance on operational control systems.

The EIA process requires the likely significant effects of the development to be identified, described and assessed before development consent is granted. Mitigation measures relied upon to support a conclusion of no significant effect must be sufficiently specific, certain, enforceable and capable of implementation. The existence of a future CEMP, future contractor method statements, future monitoring or future corrective action procedures cannot substitute for a complete and reliable assessment at application stage.

The GBWAG further submits that a complaints-led or monitoring-led approach is not an adequate substitute for avoidance and certainty. Monitoring may identify that harm is occurring, but it does not itself prevent harm. Similarly, post-consent corrective actions may reduce the recurrence of an incident, but they do not remove the requirement to assess and prevent likely significant effects before permission is granted.

Accordingly, **the GBWAG submits that the application places excessive reliance on post-consent mitigation, monitoring, contractor-led refinement and adaptive management. This undermines confidence in the conclusions of the EIAR and reinforces the concern that the proposed development has not been demonstrated, at application stage, to be acceptable in terms of proper planning, environmental protection and residential amenity.**

Should the Commission be minded to grant permission, the GBWAG requests that any permission include strict conditions requiring all updated management plans, final construction methodologies, drainage designs, peat stability measures, ecological protection measures, traffic management measures and emergency response procedures to be submitted for written approval prior to commencement, independently verified where appropriate, and expressly demonstrated to remain within the assessed environmental envelope of the EIAR.

7.11 Ground 11: Inadequate consideration of alternatives (Appendix 7)

Our client raises serious concerns in respect of the adequacy of the applicant's consideration of alternatives and the manner in which the subject site was selected for wind energy development.

The specialist submission enclosed at Appendix 7 addresses this issue in detail. In summary, that submission demonstrates that the assessment of site suitability for wind energy development is properly a plan-led exercise and, in this instance, that exercise has already been undertaken through the Offaly County Development Plan Wind Energy Strategy. That Strategy was prepared through an expert-led sieve mapping process and resulted in the clear designation of the relevant lands as "Not Suitable" for wind energy development.

The specialist submission further explains that this designation is not theoretical or arbitrary. Rather, it reflects real site-specific constraints which are borne out across the wider assessment, including hydrology, hydrogeology, biodiversity, ornithology, landscape and visual amenity, noise, residential amenity and socio-economic considerations. In that context, the applicant's alternatives assessment fails to adequately explain why lands already determined to be unsuitable under the statutory planning framework were selected over alternative locations more consistent with the plan-led wind energy strategy.

Our client is concerned that the application does not provide a transparent or robust comparative assessment of reasonable alternative sites, infrastructure layouts or project configurations. Instead, the application appears to proceed from a predetermined commitment to the Ballincor site and then seeks to justify that selection by reference to national renewable energy policy, rather than by demonstrating that the subject lands are environmentally and spatially suitable.

Our client requests that An Coimisiún Pleanála have full regard to the specialist site selection and alternatives submission enclosed at Appendix 7 when assessing the adequacy of the EIAR and the applicant's consideration of reasonable alternatives.

For the avoidance of doubt, this section is intended to introduce and briefly summarise the specialist evidence in respect of site selection and alternatives. The detailed grounds of objection are set out in full at Appendix 7.

7.12 Ground 12: Ornithology: Inadequate Baseline, Collision Risk and Cumulative Assessment (Appendix 8)

Our client raises serious concerns in respect of the adequacy of the ornithological assessment submitted in support of the proposed development. The proposed wind farm is located within a sensitive receiving environment used by a range of bird species, including SPA qualifying interest species, Annex I species and species of conservation concern. Particular concern arises having regard to the scale and height of the proposed turbines, the location of the site within the wider Little Brosna / callows landscape, and the interaction of the proposed development with bird flight paths, feeding areas, commuting corridors and cumulative wind energy development in the wider area.

Our client's concerns in respect of ornithology are addressed in detail in a separate specialist submission prepared by Pat Moran, which is enclosed at Appendix 8 to this report. That submission should be read as forming part of this objection and appeal submission.

By way of summary, the specialist submission identifies five principal failures in the applicant's ornithological assessment.

- First, the specialist submission raises concerns regarding survey methodology, including the concentration of surveys in the middle of the day, limited dawn and dusk coverage, absence of nocturnal survey methods, acoustic monitoring or radar, the exclusion of certain activity corridors from the Collision Risk Model, and limitations in viewshed coverage, including in respect of turbine T5.
- Second, the submission raises concerns regarding baseline completeness. It identifies that several SPA qualifying interest species and sensitive species were either not adequately assessed at population level or were excluded from further assessment on the basis of thresholds which may themselves be a product of the survey limitations identified above.
- Third, the submission questions the analytical credibility of elements of the Collision Risk Model, including the avoidance rates applied, the treatment of near-threshold findings, and the manner in which certain large-flock records or nationally important observations were treated inconsistently between species.
- Fourth, the submission raises species-specific concerns, including in respect of White-tailed Eagle, Hen Harrier, Merlin, Peregrine and Curlew. The specialist submission contends that the assessment fails to properly address the implications of predicted collision risk for small, vulnerable or recovering populations, where the loss of even a single breeding adult may be ecologically significant.
- Fifth, the submission raises significant concerns regarding cumulative and in-combination effects. In particular, it identifies a lack of robust combined collision mortality assessment across relevant wind energy developments affecting shared bird populations and contends that the cumulative ornithological burden has not been properly presented to, or assessed by, the competent authority.

Our client is concerned that these matters undermine the scientific reliability of the ornithological assessment and the conclusions reached in the EIAR and NIS. In particular, where survey limitations, baseline omissions, collision risk uncertainty, species-specific vulnerabilities and cumulative effects interact, the assessment cannot safely be treated as providing a complete and precautionary basis for decision-making.

Our client requests that An Coimisiún Pleanála have full regard to the specialist ornithological submission enclosed at Appendix 8 when assessing the adequacy of the EIAR, NIS, Collision Risk Model and cumulative ornithological assessment. In the event of any conflict between the applicant's conclusions and the specialist submission, our client submits that the precautionary principle must apply.

For the avoidance of doubt, this section is intended to introduce and briefly summarise the specialist ornithological evidence prepared by Pat Moran. The detailed grounds of objection in respect of ornithology are set out in full at Appendix 8.

7.13 Ground 13: Operational ecological and ornithological monitoring / adaptive management – lack of certainty and enforceability

The proposed development gives rise to significant concerns regarding the reliance placed on operational ecological and ornithological monitoring, post-construction reporting and adaptive management. While the applicant has submitted a Bird Monitoring Programme, a Biodiversity Enhancement Management Plan, bat monitoring proposals and associated mitigation schedules, the GBWAG submits that these documents do not provide sufficient certainty as to how ecological impacts will be prevented, when intervention will be triggered, what mitigation will be mandatory, who will enforce such mitigation, and what consequences will follow if adverse effects exceed those predicted within the EIAR.

The concern is not that monitoring is inherently inappropriate. Monitoring is a recognised and often necessary component of wind farm development, particularly in relation to bird collision risk, bat fatality, habitat establishment and operational biodiversity management. However, monitoring is not, in itself, mitigation. Monitoring records what is happening, or what has already happened. It does not necessarily prevent collision mortality, displacement, habitat degradation or population-level effects unless it is coupled with clear thresholds, binding mitigation responses, enforceable operational controls and independent oversight.

In the present case, the applicant's approach appears to rely heavily on future monitoring and adaptive response rather than providing a sufficiently certain operational mitigation regime at consent stage. This is particularly problematic given the ecological sensitivity of the receiving environment, the proximity of the proposed development to European sites and callows habitats, the presence of sensitive wintering bird populations, the documented use of the site and wider area by species of conservation concern, and the acknowledged potential for collision risk and displacement effects during operation.

7.13.1 Absence of a standalone operational wildlife strategy

The GBWAG notes that the application documentation does not appear to include a standalone document expressly titled an "Operational Wildlife Management Strategy" or "Operational Wildlife Monitoring Strategy". Instead, the relevant commitments are dispersed across Chapter 6 Biodiversity, Chapter 7 Ornithology, Appendix 7-3 Bird Monitoring

Programme, Appendix 7-2 Collision Risk Modelling Report, Appendix 6-1 Biodiversity Enhancement Management Plan, Appendix 6-2 Bat Survey Report, the Natura Impact Statement and the Schedule of Mitigation.

This fragmentation is itself a concern. Operational monitoring and adaptive management measures for birds, bats, Marsh Fritillary, habitat enhancement, hedgerow replacement, lighting, fatality monitoring and curtailment are spread across multiple documents. The result is that there is no single, consolidated and enforceable Operational Ecological and Ornithological Management Plan setting out all operational commitments, responsible persons, monitoring methods, trigger thresholds, mandatory responses, reporting requirements and enforcement mechanisms.

For a development of this scale, and in this receiving environment, the Commission should not be required to piece together an operational wildlife regime from multiple chapters, appendices and mitigation tables. The applicant should have provided a single, binding operational ecological management document capable of being conditioned and enforced. In its absence, the Commission cannot be satisfied that the operational ecological risks of the development will be managed with the level of certainty required.

7.13.2 Bird monitoring programme is descriptive rather than enforceable

Appendix 7-3 provides for a Bird Monitoring Programme during the pre-construction and operational phases of the proposed wind farm. The programme provides for post-construction monitoring in years 1, 2, 3, 5, 10 and 15 following construction. It includes vantage point surveys, breeding bird surveys, winter bird surveys and fatality monitoring using trained dogs. Reports are to be submitted to the planning authority and NPWS at the end of each monitoring year.

The GBWAG accepts that the proposed survey types are relevant in principle. However, the difficulty is that the Bird Monitoring Programme is largely descriptive. It identifies what surveys will be undertaken and when, but it does not clearly identify what level of recorded collision mortality, displacement, altered flight activity, reduced site usage, breeding failure, wintering bird decline, or SPA species interaction will trigger mandatory mitigation.

The programme states that reports may contain recommendations which may inform additional mitigation during the operational phase. This is materially weaker than a binding commitment to implement defined mitigation where specified trigger thresholds are exceeded. The wording leaves significant discretion to future interpretation by the operator, ecological consultants and/or planning authority after the development has already become operational.

The GBWAG submits that this is not sufficient. Where the proposed development has the potential to affect sensitive bird species, including wintering waterbirds, raptors and species associated with nearby SPAs, any monitoring programme must be tied to clear, pre-defined trigger thresholds and mandatory response actions. These should include, at a minimum, thresholds for collision fatality, repeated near-miss flight activity, displacement from known foraging or commuting areas, changes in use of the site by key species, and any evidence of effects on species forming part of nearby SPA assemblages.

Without such thresholds, the monitoring programme risks becoming an information-gathering exercise rather than a protective mitigation mechanism.

7.13.3 Operational ornithological mitigation is deferred to "unexpected" issues

Chapter 7 states that, based on the baseline surveys and the design characteristics of the proposed project, no likely significant effects on bird populations are predicted during the operational phase and no dedicated operational mitigation measures are considered necessary. It then states that a precautionary approach will be maintained and that, if unexpected ornithological issues arise during operation, such as evidence of collision risk to sensitive species, an adaptive management strategy will be implemented.

The GBWAG submits that this approach is unsatisfactory. First, it treats operational mitigation as something to be considered only if issues emerge after the wind farm is operational. Secondly, it provides no clear detail as to what constitutes an "unexpected ornithological issue". Thirdly, it does not explain what level of collision risk, fatality, displacement or behavioural change will be sufficient to require intervention. Fourthly, it does not define the content, timing or enforceability of the adaptive management strategy.

This is particularly important because adaptive management can only be relied upon where the parameters of that adaptation are clearly set out in advance. A vague commitment to respond if future monitoring identifies a problem does not provide the level of certainty required under the EIA process. If the applicant is relying on adaptive management to support a conclusion of no significant residual effect, then the adaptive management measures must be sufficiently specific, certain and enforceable at consent stage.

In the absence of such detail, the Commission is being asked to accept that if significant or unexpected operational impacts arise in the future, they will be addressed later. That is not an adequate substitute for a robust pre-consent assessment and clearly defined mitigation regime.

7.13.4 Collision risk uncertainty reinforces the need for binding triggers

The need for a robust operational monitoring and adaptive management regime is reinforced by the applicant's own Collision Risk Modelling Report. The CRM identifies uncertainty around collision risk estimates and records that central estimates of potential increases in annual mortality exceed the 1% threshold for certain populations, including local Mallard, local Black-tailed Godwit and county Kestrel. It also records that the upper range of uncertainty exceeds relevant thresholds for additional species/populations, including Grey Heron, national Black-tailed Godwit and local Golden Plover under certain avoidance assumptions.

The CRM also states that the predicted impact on the local Black-tailed Godwit wintering population is driven by a single large flock record of 1,750 birds, accounting for approximately 95% of the flight activity included in the collision risk model for that species. It notes that the estimate is highly sensitive to that single observation and should be interpreted with caution. It also acknowledges that the available data were insufficient to estimate how frequently such large flocks occur at the site or to meaningfully characterise sampling uncertainty.

This is a significant point. The applicant's own assessment recognises uncertainty in relation to a species which is a qualifying interest of the River Little Brosna Callows SPA. Such uncertainty does not justify a vague post-consent monitoring approach. It justifies a more precautionary, enforceable and species-specific operational response framework.

In circumstances where collision-risk conclusions are sensitive to rare but high-magnitude flocking events, monitoring must be designed to identify those events and respond in real time where necessary. Annual reporting after the end of a monitoring year may be too late to prevent repeated effects if significant bird activity occurs during the operational phase. A more robust approach would include seasonal operational restrictions or curtailment protocols for specific conditions, species-specific trigger thresholds, real-time ornithological response procedures during high-risk periods and mandatory review where sensitive species are recorded using the wind farm envelope.

The GBWAG submits that the absence of such measures materially undermines confidence in the applicant's residual impact conclusions.

7.13.5 SPA species and the precautionary principle

The receiving environment is located within the wider ecological context of the Little Brosna River, callows habitat and European sites supporting wintering waterbirds. The NIS identifies the River Little Brosna Callows SPA as an internationally important site for wintering waterfowl, including Greenland White-fronted Goose, Golden Plover and Black-tailed Godwit, and as nationally important for Whooper Swan, Wigeon, Teal, Pintail, Shoveler, Lapwing and Black-headed Gull. It also acknowledges that the proposed project site supports habitats suitable for SCI species and that certain SCI species were recorded during surveys.

In this context, the Commission must apply a precautionary approach. Operational monitoring cannot be treated as a mechanism to discover after the fact whether effects on SCI species are greater than predicted. Where European site interests are potentially affected, the competent authority must be satisfied before consent is granted that the proposal will not adversely affect site integrity. That conclusion must be based on complete, precise and definitive findings capable of removing reasonable scientific doubt.

The GBWAG submits that a monitoring regime which records impacts after operation begins, and then allows recommendations to be made for possible additional mitigation, does not provide the necessary certainty. If post-construction bird monitoring is being relied upon to verify or manage effects on SCI species, then the monitoring must be linked to binding operational controls. Those controls should include mandatory reporting to the planning authority and NPWS, immediate notification of any SCI collision fatality, defined thresholds for turbine curtailment, and enforceable procedures for modifying turbine operation where risk to SPA species is identified.

In the absence of such controls, the application does not provide sufficient certainty that the operational phase will avoid significant ecological effects.

7.13.6 Bat monitoring and curtailment are insufficiently defined

The same concern arises in relation to bats. The Bat Survey Report identifies a Medium overall collision risk level for high-collision-risk bat species across all three activity seasons, with the exception of Nathusius' Pipistrelle, and acknowledges limitations and knowledge gaps in relation to bats and wind farms, particularly in an Irish context. The applicant proposes feature buffers, vegetation clearance buffers, feathering of idling blades, lighting controls, post-construction bat activity monitoring and fatality monitoring.

These measures are relevant, but the operational response remains uncertain. The Bat Survey Report states that no additional control measures to avoid or reduce collision-related bat fatalities are considered warranted. It also states that post-construction fatality monitoring and activity surveys will be undertaken in years 1, 2, 3, 5 and 10, and that recommendations will be made in relation to a curtailment strategy "if required".

The GBWAG submits that this is not sufficiently certain. The report does not define what level of bat activity or fatality will make curtailment "required". It does not set out species-specific mortality thresholds. It does not identify mandatory

curtailment parameters such as wind-speed thresholds, temperature thresholds, seasonal windows, night-time periods, rainfall conditions, turbine-specific shutdown triggers or escalation procedures. Nor does it provide a clear mechanism for ensuring that any recommended curtailment is actually implemented.

The phrase "recommendations will be made" is particularly weak. A recommendation is not a binding mitigation measure. If post-construction monitoring identifies elevated bat mortality, the ecological harm has already occurred. The purpose of mitigation should be to avoid or minimise that harm in the first instance, not merely to consider whether operational controls should be recommended after fatalities are detected.

This issue is particularly important where the applicant seeks a long operational life and where vegetation management, linear feature removal, hedgerow replacement and bat buffers will alter the ecological structure of the site. A precautionary bat curtailment strategy should be defined at consent stage, with the ability to refine it based on monitoring, rather than leaving the question of curtailment to future recommendations.

7.13.7 Biodiversity enhancement and habitat monitoring lack clear failure consequences

The Biodiversity Enhancement Management Plan proposes monitoring for hedgerows, treelines, grassland, broadleaf woodland, bog woodland, Marsh Fritillary and invertebrate features. Table 4-3 identifies monitoring frequencies and broad targets, including species-rich hedgerows/treelines, species-rich semi-natural grassland, woodland development and presence of Devil's-bit Scabious.

The GBWAG acknowledges that such enhancement measures are positive in principle. However, the BEMP monitoring framework lacks clear performance thresholds, remedial obligations and consequences for failure. For example, it does not clearly state what happens if hedgerows fail to establish, if replacement linear corridors do not function for bats, if grassland does not develop into the target habitat type, if Marsh Fritillary habitat condition deteriorates, if Devil's-bit Scabious does not establish, or if biodiversity net gain is not achieved in practice.

The BEMP is framed as an enhancement document, but some of the measures also function as compensation or mitigation for habitat loss and habitat severance arising from the proposed development. That distinction matters. If habitat replacement, linear feature replanting or Marsh Fritillary habitat management is relied upon to reduce ecological effects, it must be secured by clear, enforceable and measurable commitments.

The GBWAG submits that the BEMP should include defined success criteria, minimum survival rates, habitat condition thresholds, replacement planting obligations, grazing and cutting prescriptions, remedial action timelines, reporting obligations, independent ecological review and a mechanism for securing long-term management over the operational life of the development. Without such detail, there is no certainty that the proposed biodiversity measures will achieve their stated objectives.

7.13.8 Marsh fritillary monitoring is dependent on future management decisions

Chapter 6 identifies Marsh Fritillary habitat and proposes exclusion zones, vegetation management, translocation of larval webs where avoidance is not possible, habitat management and continued monitoring. Monitoring is to occur in years 1, 2, 3, 5 and 10 and every five years thereafter, including larval web searches and habitat condition assessments. Reports are to recommend habitat management measures such as scrub control and extensive cattle grazing.

Again, the issue is not that monitoring is absent. The issue is that the future management response is not sufficiently fixed. Recommendations may be made, but the documents do not clearly identify binding trigger thresholds for intervention, minimum habitat-condition requirements, mandatory stocking rates, hydrological protection criteria, or defined consequences if the managed habitat fails to support Marsh Fritillary over time.

The proposed development also introduces operational vehicle movements within the site, and the applicant acknowledges that Marsh Fritillary is vulnerable to vehicle strike due to poor flight ability. A 20km/hr operational speed limit is proposed. However, there is no clear monitoring or enforcement mechanism to demonstrate that this speed restriction will be complied with in practice over the operational life of the project.

The GBWAG submits that, where a protected species is dependent upon ongoing habitat management, the operational management plan must be prescriptive and enforceable rather than advisory.

7.13.9 Monitoring reports must not substitute for independent oversight

Across the ecological documentation, reporting is generally proposed to the planning authority and/or NPWS at the end of monitoring years. While reporting is necessary, the GBWAG submits that annual or periodic reporting is insufficient unless accompanied by independent review and a clear obligation to implement mitigation.

There is no clear mechanism identifying who determines whether an effect "materially exceeds" that predicted in the EIAR, who decides whether curtailment is required, whether the planning authority or NPWS must approve or can require changes, what timeframe applies to intervention, and what happens if the operator disagrees with the recommended mitigation.

This is a critical enforceability gap. Adaptive management cannot be left solely to the project operator or its appointed consultant. The system must provide for independent verification, public transparency and enforceable regulatory oversight. This is particularly important where collision fatalities or habitat failures may be detected by consultants appointed by the developer and where the consequences of mitigation, such as turbine curtailment, may affect commercial output.

The GBWAG therefore submits that any adaptive management regime must include independent review by a suitably qualified ecologist not directly retained by the operator for operational reporting, mandatory submission of raw data, publication of annual monitoring reports, immediate reporting of sensitive species fatalities, planning authority approval of any proposed response and defined timelines for implementing mitigation.

7.13.10 Monitoring cannot remedy deficiencies in the pre-consent assessment

The applicant appears to rely on monitoring as a means of verifying the assumptions and conclusions of the EIAR. This is acceptable only to a limited extent. Post-consent monitoring can verify whether predictions were accurate, but it cannot remedy an inadequate assessment, nor can it justify granting permission where material uncertainty remains.

The EIA process requires the likely significant effects of a project to be identified, described and assessed before development consent is granted. Mitigation measures relied upon to reach a conclusion of no significant residual effect must be sufficiently certain, specific and enforceable at that stage. Monitoring and adaptive management may supplement mitigation, but they cannot replace it.

In the present case, the applicant's own documents contain several indicators of uncertainty: operational ornithological mitigation is deferred unless "unexpected" issues arise; collision risk estimates include acknowledged uncertainty; bat curtailment is left to future recommendations "if required"; biodiversity enhancement monitoring is based on broad targets; and Marsh Fritillary management depends on future monitoring and habitat management recommendations.

The cumulative effect is that significant reliance is placed on future ecological judgment and adaptive response. The GBWAG submits that this does not provide the level of certainty required for a development of this scale in this ecological setting.

7.13.11 Required safeguards if permission is granted

The GBWAG's primary position is that permission should be refused. However, if the Commission is minded to grant permission, it is respectfully submitted that any permission must include strict and enforceable ecological and ornithological conditions.

At minimum, the applicant should be required to submit a final Operational Ecological and Ornithological Management Plan prior to commencement of operation. This plan should consolidate all commitments relating to birds, bats, Marsh Fritillary, habitat enhancement, hedgerow replacement, lighting, fatality monitoring, biodiversity management and adaptive management.

The plan should include:

- clear species-specific monitoring methodologies;
- defined monitoring locations and search areas;
- mandatory monitoring years and seasonal windows;
- fatality detection and carcass persistence correction methods;
- species-specific collision or mortality trigger thresholds;
- mandatory turbine curtailment thresholds for birds and bats;
- turbine-specific shutdown or curtailment protocols;
- mandatory notification to the planning authority and NPWS of any sensitive species collision fatality;
- clear thresholds for habitat management intervention;
- minimum success criteria for hedgerow, treeline, grassland, woodland and Marsh Fritillary habitat measures;
- a defined response timeframe where thresholds are exceeded;
- independent ecological review of all monitoring reports;
- publication of monitoring summaries;
- retention of raw survey data for inspection; and
- enforceable powers for the planning authority to require additional curtailment or mitigation.

The plan should also provide that where recorded mortality, displacement, habitat failure or species use materially differs from the predictions in the EIAR, the operator must immediately implement defined mitigation rather than merely consider or recommend such measures.

7.13.12 Conclusion

The GBWAG submits that the proposed operational ecological and ornithological monitoring regime lacks the certainty, specificity and enforceability required for a project of this scale and sensitivity. The applicant's documents identify

monitoring programmes for birds, bats, Marsh Fritillary and biodiversity enhancement, but these are not accompanied by sufficiently clear trigger thresholds, binding mitigation responses, independent oversight or enforceable consequences.

The proposed approach therefore places excessive reliance on post-consent monitoring, future recommendations and adaptive management. Such an approach is inconsistent with the precautionary principle and with the requirement that likely significant effects be assessed and addressed before development consent is granted.

Monitoring may detect harm, but it does not itself prevent harm. In the absence of a binding and enforceable operational ecological management regime, the Commission cannot be satisfied that the proposed development will avoid unacceptable effects on birds, bats, protected species, habitat enhancement measures, European site interests and the wider ecological receiving environment.

Accordingly, the GBWAG submits that permission should be refused. In the alternative, if permission is granted, strict conditions should be imposed requiring a final, independently verified and enforceable Operational Ecological and Ornithological Management Plan prior to commencement of operation, incorporating binding trigger thresholds, mandatory mitigation responses, turbine curtailment protocols, independent reporting and planning authority enforcement mechanisms.

7.14 Ground 14: Failure to demonstrate compliance with the Precautionary Principle

The GBWAG submits that the proposed development fails to demonstrate compliance with the precautionary principle having regard to the level of uncertainty which remains across multiple environmental disciplines, including ecology, ornithology, hydrology, peat stability, shadow flicker, noise, human health and residential amenity. The application is advanced within a sensitive rural receiving environment, proximate to watercourses, peat and cutover bog habitats, protected species interests, ornithological receptors, dispersed residential properties and lands already identified as unsuitable for wind energy development under the relevant Wind Energy Strategies. In such circumstances, the Commission must be satisfied, on the basis of complete, precise and reliable information, that the proposed development will not give rise to significant adverse environmental effects.

The applicant's own documentation demonstrates that the conclusions of the EIAR are heavily dependent upon mitigation, monitoring, future surveys, operational controls and post-consent refinement. The issue is not that mitigation or monitoring are inappropriate in principle. Rather, the concern is that the application repeatedly relies upon future processes to verify, refine or respond to environmental risks which should be fully understood and resolved at application stage. The precautionary principle requires that uncertainty be addressed before development consent is granted, particularly where sensitive receptors and potentially significant environmental effects are involved.

This concern is illustrated by the Construction Environmental Management Plan and the Schedule of Mitigation Measures. The CEMP is expressly described as a "live" document which will be reviewed and updated during the project, including to address planning conditions, best practice at the time of construction, findings of pre-construction site investigations and unforeseen conditions encountered during construction. The EIAR mitigation schedule similarly provides that the CEMP will be updated prior to commencement, regularly reviewed and updated during the course of the works, and implemented by the appointed contractor under the supervision of environmental managers, ecologists, archaeologists and geotechnical engineers.

Such wording demonstrates that a material part of the environmental management framework remains subject to post-consent development, contractor input and future revision. While this may be acceptable for detailed construction administration, it cannot substitute for a robust pre-consent assessment of likely significant effects. The Commission must assess the project before it, not a future version of the project as it may be refined by contractors, planning conditions, future surveys or adaptive management measures.

The same concern arises in respect of hydrology and surface water management. The Surface Water Management Plan states that it is a "Planning Stage" document and that the associated drainage strategy will be subject to further revision following planning permission and detailed design. This is significant given the sensitivity of the receiving environment, including the Little Brosna River, associated tributaries, drainage channels and the grid connection crossings. The effectiveness of the hydrological mitigation regime depends upon drainage design, settlement ponds, silt control, turbidity monitoring, maintenance, inspections during and after heavy rainfall, and the ability of site personnel to respond to changing conditions. These matters are central to the avoidance of pollution, sediment release and downstream ecological effects, and should not be treated as secondary matters capable of being fully resolved after permission is granted.

The biodiversity mitigation framework further demonstrates the extent of reliance on future ecological surveys and responsive mitigation. The application provides for pre-construction surveys for invasive alien species, otter, badger and other protected mammals, bats, common frog, Marsh Fritillary and associated habitat features. It also provides for future derogation licensing, translocation, exclusion zones, ecological supervision and monitoring where protected species or habitat features are identified. These measures are not merely administrative; they are designed to determine whether protected species or sensitive ecological receptors are present at the time works commence and to decide what avoidance or mitigation is then required.

The GBWAG submits that this approach leaves a material degree of uncertainty at application stage. If future surveys may identify new protected mammal activity, bat roosting features, frog spawn, Marsh Fritillary larval webs, invasive species extent or other ecological constraints requiring altered mitigation, then the Commission cannot be satisfied that all ecological effects have been fully assessed and resolved at the point of decision. The reliance on future surveys and adaptive ecological response confirms that the baseline and mitigation position remains conditional and subject to change. This issue is particularly acute in respect of ornithology. The applicant's own ornithological chapter adopts a precautionary, avoidance-led mitigation strategy and provides for ongoing monitoring. It also acknowledges that, if unexpected ornithological issues arise during the operational phase, such as evidence of collision risk to sensitive species, an adaptive management strategy will be implemented. The post-construction bird monitoring programme is intended to monitor bird use of the site, turbine interactions, displacement effects and collision risk, with reporting to inform mitigation and adaptive management over time.

This is a significant admission. It indicates that the assessment does not fully close out operational ornithological risk at application stage but instead relies on long-term monitoring and adaptive management if effects materially exceed those predicted. In circumstances where the receiving environment includes sensitive wintering bird interests, whooper swan activity and nearby SPA-related ornithological sensitivities, the Commission should not accept a monitoring-led approach as a substitute for certainty in the assessment of likely significant effects.

The land, soils and geology assessment also demonstrates reliance on future management and monitoring. The applicant acknowledges that peat and soft sediments are present, that construction will require deep excavations at turbine locations, and that temporary works may be required to manage instability at excavation locations. The management of peat stability is proposed to continue throughout the construction and operational stages through a geotechnical risk register, with excavation works monitored by a suitably qualified geotechnical engineer or engineering geologist and earthworks avoided during severe weather conditions. Again, while such measures may be necessary, they confirm that the project depends on ongoing risk management rather than the complete elimination of uncertainty.

In the context of peat, hydrology and ecological receptors, this is particularly important. The potential consequences of failure in drainage control, sediment management or peat stability are not confined to the immediate construction footprint. Effects may be transmitted through surface water pathways and may affect downstream aquatic habitats, water quality, fisheries, wetland habitats and protected ecological receptors. The precautionary principle requires that such risks be assessed and avoided with a high degree of confidence before permission is granted.

The applicant's approach to shadow flicker and operational amenity effects further reinforces the concern. The proposed development is presented as acceptable on the basis of future turbine control systems, receptor co-ordinates, turbine shutdown software, operational monitoring and complaint response procedures. This is symptomatic of a broader pattern in the application: impacts are identified, but their acceptability is then made dependent on future operational systems, post-consent refinement or resident-led complaint mechanisms.

The GBWAG respectfully submits that the Commission should be cautious in accepting this approach. Monitoring is not mitigation unless it is tied to clear, enforceable, immediate and effective response mechanisms. Adaptive management is not a substitute for robust assessment where the existence or significance of an effect remains uncertain. A complaints procedure is not equivalent to prevention. Future surveys cannot retrospectively cure deficiencies in baseline assessment if those surveys reveal materially different ecological or environmental conditions after permission has already been granted.

In this case, the cumulative reliance on future surveys, monitoring, mitigation schedules, live management plans, contractor-led implementation, adaptive management and post-consent refinement gives rise to reasonable scientific and planning doubt as to whether the proposed development has been fully assessed in accordance with the precautionary principle. The issue is not confined to one topic chapter. It arises across the application as a whole and is particularly concerning given the environmental sensitivity of the receiving environment and the strategic planning designation of the lands as unsuitable for wind energy development.

Accordingly, the GBWAG submits that the application has failed to demonstrate, on the basis of complete and reliable information, that the proposed development would avoid significant adverse environmental effects. In the absence of certainty regarding ecological effects, ornithological risk, hydrological protection, peat stability, shadow flicker mitigation, noise impacts and residential amenity, the precautionary principle requires that permission be refused.

In the alternative, should the Commission be minded to grant permission, it is submitted that any permission must include strict, enforceable and independently verifiable conditions requiring updated pre-construction ecological, ornithological, hydrological and geotechnical surveys; independent approval of final CEMP, SWMP, peat stability and biodiversity management measures; real-time water quality monitoring; enforceable stop-work triggers; independently verified shadow flicker controls; and clear public reporting of monitoring outcomes and mitigation compliance. However, the GBWAG's primary position remains that the level of uncertainty and post-consent deferral in the application is such that permission should not be granted.

7.15 Ground 15: Inadequate consideration of combined effects

The GBWAG submits that the EIAR does not provide an adequate, integrated or precautionary assessment of the combined and cumulative effects of the proposed development. While cumulative effects are addressed within individual

topic chapters, the assessment is materially deficient in that it treats cumulative impacts in a largely compartmentalised manner and fails to consider the overall combined environmental burden arising from the proposed development together with existing, permitted and proposed wind energy developments, grid infrastructure, BESS infrastructure, turbine delivery works and other major infrastructure within the wider receiving environment.

The issue is not simply whether any one environmental discipline, considered in isolation, reaches a conclusion of "*not significant*". The purpose of cumulative assessment is to consider whether the addition of multiple effects, including effects which may individually be minor or moderate, gives rise to a larger and more significant environmental impact when experienced together. This is particularly important in the present case where the proposed development would introduce eleven turbines of up to 180 metres tip height, a 110kV substation, BESS infrastructure, internal access roads, borrow pits, grid connection works, turbine delivery works, tree felling, hedgerow removal and associated construction activity into a sensitive rural receiving environment already influenced by existing and permitted wind energy development.

The applicant's own LVIA recognises that cumulative landscape and visual impact assessment is concerned with "*additional changes to the landscape or visual amenity caused by the proposed project in conjunction with other developments*". The LVIA also acknowledges that there are currently three operational wind farms and two permitted wind farms within the study area, including Lacka Wind Farm, Carrig Wind Farm, Cush Wind Farm, Derrinlough Wind Farm and Cloghan Wind Farm. This confirms that the proposed development is not being introduced into a landscape free from comparable infrastructure, but into an area where wind energy development is already a material and increasing component of the landscape baseline.

7.15.1 Fragmented approach to cumulative assessment

The cumulative assessment is presented primarily through separate topic-specific conclusions, with each chapter generally concluding that cumulative effects are not significant. However, there is no sufficiently robust synthesis of the combined effects experienced by local residents, ecological receptors, landscape receptors, hydrological receptors and the wider rural environment.

This is a material deficiency. Residents and environmental receptors do not experience the proposed development in isolated technical compartments. The lived and environmental reality of the proposed development would comprise the combined effect of turbine visibility, blade movement, operational noise, shadow flicker, construction traffic, grid connection works, BESS infrastructure, substation infrastructure, landscape change, ecological disturbance, water quality risk and the presence of other existing or permitted wind energy developments in the wider area.

The EIAR therefore understates the overall environmental effect by repeatedly treating individual effects as "not significant" in isolation and then relying on those conclusions to discount cumulative significance. This approach fails to grapple with the central planning question, namely whether the combined effect of the proposed development and other projects would materially alter the character, amenity and environmental sensitivity of the receiving area.

7.15.2 Cumulative landscape and visual effects

The cumulative landscape and visual assessment is of particular concern. The LVIA acknowledges that Lacka Wind Farm is located approximately 2.5km southwest of the site and already contributes to landscape character at a local level. It further accepts that, in combination with that operational wind farm, the proposed development would "contribute to the extent and intensity of wind energy development within the central study area". This is a significant admission.

Notwithstanding this, the LVIA concludes that the proposed development would not result in a marked change in landscape character and would not cause the area to become defined by wind energy development. The GBWAG respectfully submits that this conclusion understates the planning significance of the acknowledged increase in the extent and intensity of wind energy development, particularly having regard to the scale of the proposed turbines, the proximity of local receptors and the fact that the lands have already been identified as unsuitable for wind energy development under the relevant Wind Energy Strategies.

The applicant's own cumulative ZTV mapping is also important. The LVIA states that, from the vast majority of areas with potential visibility of the proposed development, there is also potential to see other existing or permitted wind farms within the study area.

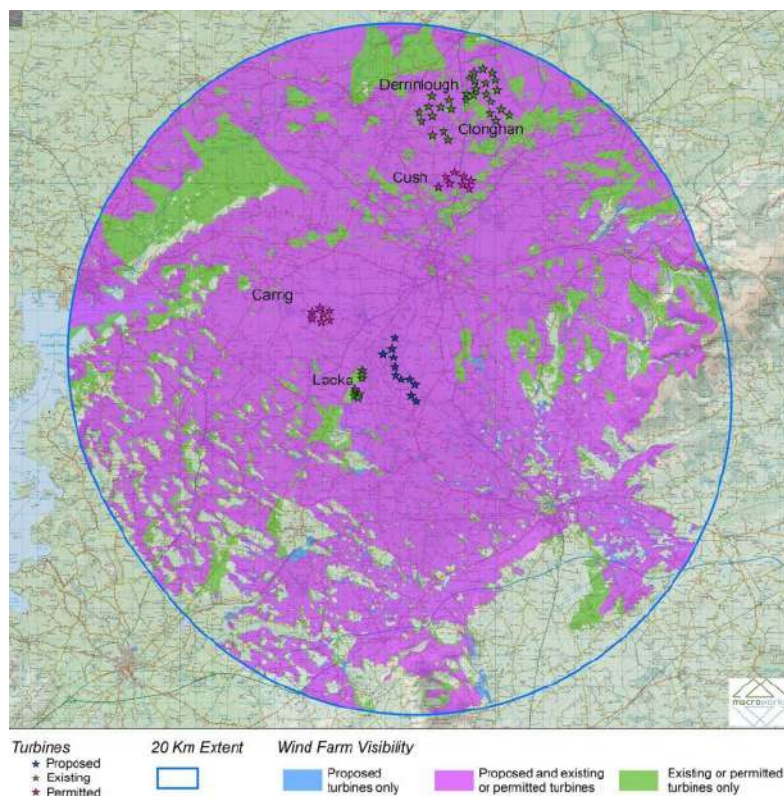


Fig. 35: Cumulative ZTV Map (Source: EIAR Chapter 12, Figure 12.12)

The applicant seeks to reduce the significance of this issue by stating that the cumulative ZTV is based on a bare-ground scenario and may overrepresent actual visibility. However, the ZTV remains relevant as it demonstrates the spatial extent of potential cumulative visibility across the study area. In a rural landscape where visual amenity, scenic approaches, settlement setting and local landscape character are central planning considerations, the Commission should not dismiss this cumulative pattern merely because vegetation or local topography may screen views from certain individual locations.

The viewpoint assessments further demonstrate that notable visual effects would arise at a number of local community viewpoints. The LVIA identifies a "Substantial-moderate" negative long-term effect at VP20, which is located approximately 1km from the nearest turbine, and "Moderate" negative long-term effects at VP21, VP22 and VP23. The assessment also acknowledges a "marked increase in the scale and intensity of built development" at VP20 and a "*much larger scale and intensity of built development than currently occurs within this scene*" at VP22. At VP23, the LVIA acknowledges a "*considerable increase in the scale and intensity of kinetic built development in view*".

VP20	L1071 at Doughkill This view is experienced by local road users and local residents and features open agricultural fields extending into the middle ground, which are defined by hedgerows and mature trees. A forest plantation then forms a flat vegetated skyline to the southeast. A cluster of farm buildings and a dwelling are glimpsed through gaps in the vegetation. In the background, a gentle hill covered with wooded patches and agricultural fields is visible.	Medium-low	This is a close view of the proposed wind farm from 1km away looking along the long axis of the array. The upper profile of the structures within the proposed substation and the associated lightening rods can also be seen rising above the treeline in the near middle distance. The turbines are seen at a dominant but not overbearing scale in this broad rural context. Indeed, they are seen in a clear and legible manner with a strong sense of perspective generated between the nearest and furthest turbines due to the scale differential between them. This emphasises the depth of the array and the provides a sense of space and distance to reinforce the extent of receiving context. There is a marked increase in the scale and intensity of built development within this visual setting, but it is a broad and productive rural context that can accommodate the wind farm in terms of scale and function. Overall, the magnitude of visual impact is deemed to be High and the quality of effect, Negative.	Substantial-moderate/ Negative/ Long-term	Not Significant
VP21	R492 at Sharavogue Experienced by regional road users and the local community, the view from this field gateway features large open fields of crops extending into the middle ground. A dense belt of mature vegetation marks the boundary of these fields and contains much of the view beyond. In the background, a small hill covered with a mix of woodland and agricultural fields is visible and this also hosts turbines from the Lacka Wind Farm.	Medium-low	The proposed turbines and met mast are seen at a prominent scale from this distance, but most are substantially screened by the intervening treeline such that two turbines are fully visible and only the partial blade sets of the remainder can be seen above and between trees. Even though there is some ambiguity and clutter associated with those more distant turbines that rotate amongst the intervening treeline, the nearer, more legible and prominent turbines tend to counter balance such aesthetic effects. This is a broad rural context that can absorb this scale and nature of this development, but that does not negate the fact that the development introduces tall moving structures into this otherwise typical rural scene. On balance, the magnitude of visual impact is deemed to be High-medium and the quality of effect is Negative.	Moderate/ Negative/ Long-term	Not Significant
VP22	L1072 at Ballinamoe Experienced by local road users and local residents, the foreground features gently undulating agricultural fields extending beyond a low stonewall. Clumps of mature trees and hedgerows in the middle ground, mark the field boundaries. In the background, rolling hills covered with an agricultural fields and wooded land are visible.	Medium-low	Similar to VP20 and VP21, this close view of the proposed wind farm presents the four nearest turbines at a prominent, but not overbearing scale rising with full blades sets exposed above the foreground terrain. The remaining turbines trail beyond at a smaller scale and with a higher degree of screening by the intervening terrain and vegetation. This is a clear and unambiguous view of the wind farm within a broad and productive rural setting that accommodates the scale and function of the development. However, the proposed turbines introduce a much larger scale and intensity of built development than currently occurs within this scene. Overall, the magnitude of visual impact is deemed to be High-medium and the quality of effect is Negative.	Moderate/ Negative/ Long-term	Not Significant
VP23	L80283 at Rath Beg Experienced by local road users and the local community, this view features a wooden post and rail fence in the foreground, beyond which the ground opens up to gently down-sloping agricultural fields interspersed with mature trees and hedgerows. Several dwellings and farmsteads are visible, integrated within the broad undulating landscape. In the middle distance, a low farmed ridge hosts a line of wind turbines from the Lacka Wind Farm which present in silhouette against the sky. A line of distant mountains can be seen in the far distance.	Medium-low	Six of the proposed turbines to the southwest will rise at a prominent scale from the farmland plateau in the middle ground. They are fully visible in a legible manner with generous and relatively even spacing. The four remaining turbines to the west are substantially screened by foreground vegetation revealing partial blades sets rotating against the intervening vegetation. This is more ambiguous in an aesthetic sense but counterbalanced by the legible view of their openly visible counterparts. There will be a considerable increase in the scale and intensity of kinetic built development in view, but without them being an introduction of an unfamiliar feature. They are well accommodated in terms of scale and function within this productive rural landscape that already contains turbines. The scale of the proposed turbines somewhat dwarfs those that exist on the skyline beyond, but rather than causing scale confusion it tends to emphasise or even overemphasise the separation distance between them. Overall, the magnitude of visual impact is deemed to be High-medium and of a Negative quality.	Moderate/ Negative/ Long-term	Not Significant

Table 8: Extract of Local Community Viewpoint Effects — VP20 to VP23 Source: EIAR Chapter 12 / Appendix 12.1 Visual Impact Assessments at VRPs.

These findings are material. Even where the applicant ultimately classifies these effects as not significant in EIA terms, they demonstrate that the proposed development would introduce a substantial localised visual change. When considered cumulatively with Lacka Wind Farm and other permitted wind energy developments, the proposal would materially intensify the presence of wind energy infrastructure in the wider rural landscape.

7.15.3 Ornithological and ecological combined effects

The treatment of cumulative ornithological and ecological effects is also insufficient. The ornithology chapter identifies a 20km cumulative assessment study area and considers other wind energy developments, including Carrig, Lacka, Skehanagh, Cush, Derrinlough, Monaincha Bog and Cloghan. The chapter also identifies overlapping Key Ornithological Receptors across these projects, including species such as Whooper Swan, Golden Plover, Greenland White-fronted Goose, Lapwing, Curlew and Snipe.

However, the cumulative ornithology assessment appears to proceed largely on the basis that, because the proposed development is predicted to have no significant effects and because other wind farm assessments are also said to have no significant residual effects, the combined effect must therefore remain negligible. This approach is overly simplistic. It does not adequately interrogate the incremental effects of multiple wind energy developments across the same wider lowland, peatland, callows and agricultural landscape used by wintering birds, wetland birds and other mobile species.

The same concern arises in respect of biodiversity. The biodiversity chapter defines cumulative effects by reference to the addition of many minor or insignificant effects creating larger, more significant effects. However, the assessment then repeatedly discounts cumulative effects by relying on the absence of significant residual effects in individual projects, the availability of suitable habitat in the wider landscape and the implementation of mitigation measures.

The GBWAG submits that this approach fails to adequately assess combined pressure on sensitive ecological receptors, including hydrologically connected habitats, wetlands, bogs, woodland, hedgerows, aquatic habitats, bats, otter, badger, amphibians, Marsh Fritillary habitat and downstream ecological receptors. The fact that individual projects may be assessed as not significant does not automatically mean that the combined effect of multiple projects, associated grid connections, road works, drainage works, felling and operational disturbance is also negligible.

This is particularly important given that the proposed development itself has undergone iterative redesign in response to ecological and ornithological constraints. The alternatives chapter confirms that a turbine was removed from the north of the site as a precautionary avoidance measure where Whooper Swan were noted to occasionally feed in winter months, and that lands to the north were avoided due to the presence of feeding and roosting areas for wintering waterfowl and waders, some of which are associated with nearby European sites. This demonstrates that the receiving environment is not inherently unconstrained and that cumulative ornithological risk requires a more precautionary assessment.

7.15.4 Cumulative noise effects

The cumulative noise assessment also gives rise to concern. Chapter 11 confirms that the cumulative turbine noise from the existing operational Lacka and Skehanagh Wind Farms and the permitted Carrig Renewables Wind Farm has been included in the assessment. The applicant ultimately concludes that the effect on the noise environment associated with the proposed development in combination with other wind farm developments is not significant.

However, the GBWAG submits that this conclusion must be treated with caution having regard to the concerns already raised in Ground 3 of this submission. The assessment of cumulative noise is dependent on modelling assumptions, background noise data, wind direction assumptions, the use of screening rules and the treatment of the relative contribution from individual wind farms. The practical residential amenity question is not simply whether the proposed development's contribution can be technically separated from existing or permitted wind farm noise, but whether residents will experience an acceptable cumulative acoustic environment.

This is particularly important where the applicant's own predicted noise tables identify locations where cumulative night-time levels approach or exceed relevant night-time criteria, but where the contribution from the proposed development is then discounted by reference to acoustic scoping methodology. The GBWAG submits that such an approach risks conflating a technical attribution exercise with the broader planning obligation to assess cumulative environmental effects. Residents experience the total noise environment, not the legal or mathematical apportionment of noise between separate operators.

Accordingly, the Commission should not accept the cumulative noise conclusion unless it is satisfied that the assessment fully reflects the actual cumulative noise environment likely to be experienced at affected dwellings, including night-time periods, higher wind speeds, potential valley propagation effects and the presence of existing and permitted wind energy developments.

7.15.5 Associated infrastructure and combined construction effects

The proposed development is not limited to turbines. It includes substantial associated infrastructure, including a 110kV substation, BESS infrastructure, internal access roads, borrow pits, construction compounds, tree felling, hedgerow removal, a 12.23km grid connection route to Dallow 110kV substation, joint bays, HDD crossings and turbine delivery accommodation works.

The Planning Statement confirms that a ten-year permission is sought for the wind farm and that certain turbine delivery route works within the public road corridor will be sought separately, albeit identified and assessed within the EIAR. A permanent permission is also sought for the grid connection and substation infrastructure. The GBWAG submits that this reinforces the need for a genuinely integrated cumulative assessment of the entire project and associated works, together with other grid, BESS, cable and wind energy projects in the Dallow / Birr / Riverstown / Carrig wider area.

Of particular relevance are the permitted and proposed grid-related developments identified in the applicant's own documentation, including the Carrig Wind Farm grid connection, the Stonestown cable application and the Clondallow BESS proposal. Even where each individual project is assessed as unlikely to give rise to significant cumulative effects, the combined pattern is one of increasing electrical, wind energy and energy storage infrastructure concentrated around a sensitive rural and settlement edge environment.

The cumulative assessment does not adequately assess this broader infrastructure pattern or the combined construction phase effects arising from overlapping or sequential works, including road disruption, excavation, HDD activity, haulage, sediment risk, noise, vibration, traffic, hedge removal, temporary land take and cumulative disturbance to local residents and ecological receptors.

7.15.6 Combined pressure on sensitive environmental receptors

The proposed development is located within a sensitive receiving environment comprising low-lying rural lands, peatland and cutover bog, woodland, agricultural land, local watercourses, the Little Brosna River corridor, nearby European and national ecological designations, dispersed rural dwellings and the wider landscape setting of Birr and surrounding settlements.

The applicant's own documentation confirms that the proposed development would introduce new long-term negative effects across a range of environmental topics, even where those effects are ultimately classified as not significant in EIA terms. The combined relevance of these effects should not be overlooked. Long-term turbine visibility, operational noise, shadow flicker risk, ecological disturbance, hydrological risk, landscape change and construction activity may each be assessed separately, but they are experienced cumulatively by people, species and places.

The GBWAG submits that the EIAR fails to provide a sufficiently clear, integrated assessment of these combined effects. The assessment does not adequately answer the cumulative planning question: whether the proposed development, when added to existing and permitted wind energy, grid, BESS and infrastructure development in the wider area, would result in an unacceptable intensification of industrial-scale renewable energy infrastructure within a landscape and environmental setting already identified as unsuitable for wind energy development.

For these reasons, the GBWAG submits that the cumulative assessment understates the likely overall environmental impact of the proposal. The Commission cannot be satisfied that the combined effects on landscape character, visual amenity, residential amenity, ornithology, ecology, noise, hydrology and the wider rural environment have been adequately assessed. Permission should therefore be refused.

In the alternative, if the Commission is minded to grant permission, it is submitted that further information should be required addressing cumulative landscape and visual effects, cumulative noise, cumulative ornithological displacement and collision risk, cumulative ecological and hydrological effects, and the combined construction impacts of the wind farm, grid connection, BESS, substation, turbine delivery works and other relevant energy infrastructure in the wider area.

7.16 Ground 16: Health, safety, and fire concerns for the surrounding community

The GBWAG raises serious concerns regarding the adequacy of the assessment of health, safety and fire risk associated with the proposed Battery Energy Storage System ("BESS"), substation, transformers, inverter infrastructure and associated electrical plant. These concerns are advanced in the context of the scale of the proposed BESS compound, the rural receiving environment, the presence of nearby residential properties and the reliance placed by the applicant on future detailed design, future emergency planning, future fire service consultation and ongoing operational monitoring.

The GBWAG acknowledges that the application is accompanied by Appendix 2-7, titled "Battery Energy Storage System Fire Risk Assessment". Accordingly, the GBWAG does not suggest that fire risk has been wholly omitted from the application documentation. However, the presence of a Fire Risk Assessment does not, of itself, demonstrate that the proposed development is acceptable. The assessment must be sufficiently detailed, site-specific, precautionary and enforceable to allow the Commission to conclude that risks to residents, emergency responders, the environment and property have been properly understood and mitigated at consent stage.

In this case, the applicant's own Fire Risk Assessment confirms that the BESS facility will include a substantial concentration of lithium-ion battery and electrical infrastructure. The BESS development is stated to comprise, inter alia, 90 no. battery energy storage containers, 15 no. MV inverter containers, an auxiliary transformer, switchgear room, COSHH container, underground electrical and communications cabling, access roads, hardstanding, security fencing, CCTV, lighting, drainage infrastructure and a water storage tank. This is not a minor ancillary component. It is a significant industrial electrical installation forming part of the overall wind farm development.



Fig. 36: Ballincor Battery Energy Storage System Site Layout (Source: Appendix 2-7 BESS Fire Risk Assessment, Figure 1)

The GBWAG submits that the Commission must assess the BESS as an integral element of the proposed project. It cannot be treated as a peripheral or secondary matter. Fire, explosion, smoke, toxic gas, contaminated residue, emergency access, firefighter safety, water supply, evacuation, public warning and environmental runoff issues are all relevant planning considerations where large-scale lithium-ion battery infrastructure is proposed in a rural setting.

7.16.1 Applicant's own fire risk assessment confirms a complex and specialist risk profile

Appendix 2-7 expressly acknowledges that, although the BESS facility may not be considered complex based solely on its size and layout, "the complexity of the inverter stations and the presence of high DC current and Lithium-Ion battery cells may warrant it being considered as a complex facility". This is a material acknowledgement. It confirms that the proposal gives rise to specialist risk considerations beyond those associated with a conventional small industrial building or ordinary electrical compound.

The Fire Risk Assessment further states that Technical Guidance Document B provides generic fire safety guidance for industrial buildings but does not adequately deal with "unique or unusual structures" such as lithium-ion energy storage system containers. It is also stated that the BESS enclosures are non-walkable and, as such, are treated as exempt from compliance with Building Regulations under "buildings not frequented by people". The GBWAG submits that this creates an important regulatory and planning concern. A major element of the proposed development is being assessed through a fire engineering risk approach rather than through a conventional building control framework designed specifically for this type of infrastructure.

This does not mean that the BESS cannot be assessed. However, it does mean that the Commission should require a high degree of certainty at planning stage. Where the applicant's own fire consultant acknowledges that standard building guidance does not adequately address this type of infrastructure, the Commission should be slow to rely on generic assurances, future detailed design, manufacturer systems and post-consent emergency planning as sufficient safeguards.

The Fire Risk Assessment concludes that the overall risk is "tolerable" only on the basis that all measures, including training, controls, monitoring and fire detection systems, are implemented, installed and maintained to the standards detailed in the report and to manufacturer and EirGrid-specific guidelines. The conclusion is therefore expressly conditional. It is not a finding that the BESS is inherently safe irrespective of future design, installation, operation and emergency management. Rather, it is a finding that the risk may be tolerable if multiple layers of future controls operate as intended.

7.16.2 Lithium-ion battery fire risks, toxic gases and emergency responder safety

The applicant's Fire Risk Assessment identifies a number of serious hazards associated with a BESS fire. It recognises that lithium-ion battery fires may involve overheating cells, fire within a rack, potential explosion or ejection, rapid temperature increase, damage to adjacent battery cells and escalation within a container. It also identifies the possibility of explosive atmospheres within containers and acknowledges that lithium-ion batteries can rapidly evolve flammable or explosive gases under abnormal failure conditions.

The Fire Risk Assessment further recognises risks to persons arising from toxic gas release. It states that burning batteries may produce toxic hydrogen fluoride gas, that fire may produce irritating, corrosive and/or toxic gases, and that fumes may cause dizziness or suffocation. It also identifies risks from battery electrolyte, DC arcs, exposed DC conductors, stranded electrical energy and the possibility that firefighters may not be familiar with specific techniques for dealing with DC electrical fires.

These matters are not speculative concerns raised by the GBWAG. They are recognised in the applicant's own Fire Risk Assessment. The presence of such hazards requires more than a general statement that monitoring and suppression systems will be installed. It requires a clear, site-specific demonstration of how such incidents will be prevented, detected, contained, communicated and managed in practice.

The Fire Risk Assessment also states that traditional firefighting methods, including water-based firefighting, would not be suitable for fighting a fire in a BESS facility, and that firefighting activities would likely be limited to preventing fire spread beyond the boundaries of the facility. This is a critical point. In practical terms, the emergency response strategy appears to rely heavily on early detection, automatic suppression, containment within the container of origin, isolation, remote monitoring and boundary protection, rather than direct firefighting intervention into the BESS units themselves.

The GBWAG submits that this reinforces the need for a robust, finalised and independently reviewed emergency management strategy before consent is granted, or at minimum before any works commence. If firefighting response is constrained by the nature of the infrastructure, then prevention, detection, public warning, isolation and containment become all the more important.

7.16.3 Over-reliance on future monitoring, suppression and manufacturer control systems

The applicant's assessment places significant reliance on monitoring, battery management systems, SCADA systems, fire detection, suppression systems, emergency stop systems, remote monitoring and automatic shutdown. These are important safeguards, but they are also future operational systems whose effectiveness depends on correct design, installation, commissioning, maintenance, testing, staffing, training and emergency response.

The Fire Risk Assessment states that the BESS will be protected by a SCADA multiple-layer safety system providing monitoring and control from individual battery cell level up to full system control. It further states that each storage rack will have an individual Battery Management System, that voltage, current and temperature will be monitored, and that readings outside safe operational ranges will trigger action at cell, module, rack, container or system level depending on severity.

It is also stated that each container will be equipped with smoke detectors, heat detection, suppression systems, emergency stop buttons and manual override facilities. These measures are welcome in principle. However, the Fire Risk Assessment does not appear to provide a quantified failure scenario assessment identifying what would occur if one or more of these systems fails, is delayed, is incorrectly maintained, is isolated, or does not prevent escalation.

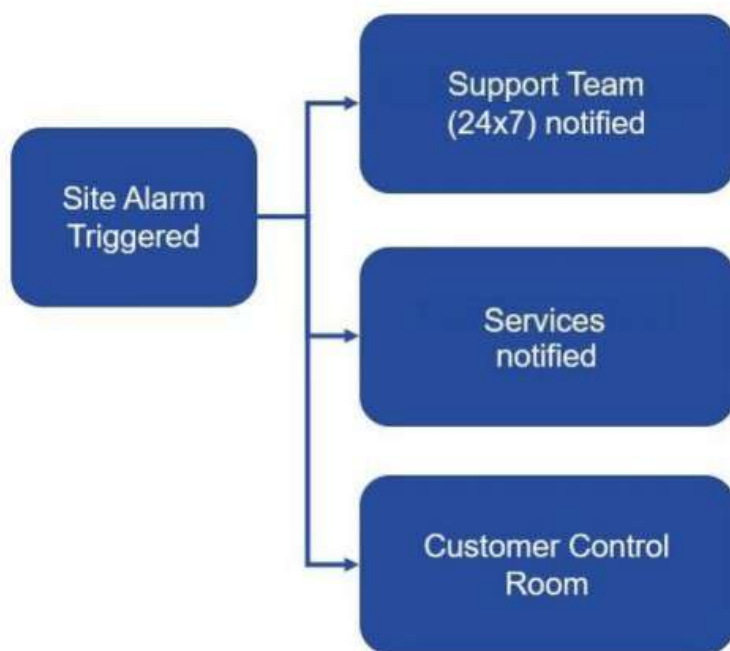


Fig. 37 41: Cause and Effect – BESS Monitoring and Alarm Response (Source: Appendix 2-7 BESS Fire Risk Assessment, Figure 6)

The GBWAG submits that the assessment should not simply assume that all control systems will operate perfectly. Major accident and fire safety assessment should consider credible failure modes, including delayed detection, fire suppression failure, cell-to-cell propagation, container-to-container spread, off-gassing without visible flame, smoke plume generation, toxic gas release, stranded electrical energy and restricted firefighter access.

The Fire Risk Assessment itself states that compliance with the recommendations of the report will not guarantee that a fire will not occur. It also confirms that the design of mechanical and electrical systems, including fire alarm and suppression systems, is a specialist area and that design and specifications must be developed at the appropriate stage in consultation with specialist designers. The GBWAG submits that this is a material limitation. It confirms that important aspects of the fire safety strategy remain to be developed after the planning application stage.

7.16.4 Fire service consultation and pre-incident planning remain deferred

A further concern relates to the timing and certainty of fire service consultation and emergency response planning. The Fire Risk Assessment states that there will be close liaison with the fire services before the facility becomes operational, that a site visit will be arranged, and that a Pre-Incident Plan will be devised thereafter. It also states that consultation with Tipperary Fire Service will be initiated at the earliest possible convenience to ensure that both parties are aware of the risks associated with firefighting in a BESS facility.

The GBWAG submits that this is insufficiently certain at planning stage. Fire service consultation, emergency access assessment, water supply requirements, evacuation arrangements, site familiarisation, hazardous materials procedures and public warning arrangements are not matters which should be left wholly to the post-consent or pre-operational stage. They go directly to the acceptability of the proposed development and to the safety of residents, site personnel and emergency responders.

This is particularly important because the Fire Risk Assessment recognises that the fire service will not be expected to enter the facility or attempt suppression until equipment has been electrically isolated by an authorised person from RWE Renewables. It also states that the RWE "Authorised Person" should be consulted before any entry to the facility is attempted. This means that emergency response is dependent upon the availability, response time and competence of specific authorised personnel, in addition to the fire service itself.

The application does not appear to provide a final Pre-Incident Plan, final Emergency Action Plan, confirmed response time assessment, confirmed fire service access strategy, agreed firefighting water strategy, site-specific evacuation radius, toxic gas response protocol or public alerting procedure. Instead, these matters are to be addressed through future liaison, future plans and future operational procedures.

The GBWAG submits that, in a rural area with dispersed housing and limited immediate emergency infrastructure, this level of deferral is unacceptable. The Commission should not be asked to grant permission first and rely on emergency planning later.

7.16.5 Insufficient assessment of toxic gas dispersion, evacuation and public warning

The applicant's Fire Risk Assessment identifies toxic gas risk but does not appear to provide a site-specific toxic gas dispersion assessment, plume modelling, evacuation radius assessment or residential receptor safety analysis. The assessment recognises that burning batteries may produce hydrogen fluoride and that fumes may cause dizziness or suffocation. It also notes that lithium-ion batteries may rapidly evolve flammable or explosive gases under abnormal failure conditions.

Despite this, the risk to surrounding residents is described as tolerable on the basis of monitoring, fire detection and suppression systems. The GBWAG submits that this conclusion is not sufficiently substantiated. The issue is not simply whether the probability of a fire is low. The issue is also whether the consequences of a credible BESS fire have been properly assessed for surrounding receptors, including residents, emergency responders, road users, agricultural users and ecological receptors.

A site-specific assessment should identify the nearest sensitive receptors, likely wind conditions, potential smoke and toxic gas dispersion pathways, evacuation triggers, exclusion zones, public warning procedures and emergency service response arrangements. It should also address whether residents would receive automatic notification in the event of a BESS fire or off-gassing event, whether a siren or other public alerting mechanism is proposed, whether the local road network could be controlled, and who would have responsibility for advising residents to shelter in place or evacuate.

The Fire Risk Assessment states that an evacuation plan may be required for occupants of the surrounding area due to the toxic nature of smoke produced from a fire involving an electricity generating facility. This is a significant statement. If such an evacuation plan may be required, then the Commission should not grant permission without knowing whether it is required, what area it would cover, who would implement it, how residents would be notified, and how it would interact with local emergency services.

7.16.6 Environmental risk, firewater and contaminated residues

The Fire Risk Assessment identifies potential environmental risks from a fire, including the release of toxic smoke into the air and the potential presence of heavy metals and other toxins in fire-damaged components and residues. It also states that battery electrolyte spillage will not reach ground or water level because it will be contained within the container.

The GBWAG submits that further scrutiny is required. The assessment appears to rely on the assumption that fires will be contained within individual containers and that traditional water-based firefighting will not be applied within the BESS facility. It states that firefighting water may be used around the boundaries of the site to prevent fire spread to adjacent vegetation and that, because such water would not come into contact with electrical containers or structures, it would not pose a hazard to the local environment.

This conclusion depends on a relatively controlled fire scenario. It does not appear to address in sufficient detail what would occur if fire spreads beyond the container of origin, if multiple units are involved, if suppression is unsuccessful, if external firefighting water is used more extensively than anticipated, if contaminated residues are mobilised by rainfall, or if emergency conditions require a different response from that assumed in the assessment.

This is particularly relevant having regard to the wider environmental sensitivity of the proposed wind farm site, including peat, drainage features, watercourses, the Little Brosna River corridor and downstream ecological receptors. Firewater, contaminated residues, firefighting foam, battery debris, suppression agent residues and toxic smoke deposition could all have environmental consequences if not properly contained and managed.

The Fire Risk Assessment states that a waste disposal plan shall be developed to consider how toxic by-products resulting from a fire incident should be disposed of. The GBWAG submits that this is another example of a material issue being deferred. A waste disposal and contaminated residue management plan should be available at consent stage, or at least required as a strict pre-commencement/pre-operation condition, given the nature of the infrastructure proposed.

7.16.7 Fire safety certificate, building regulation and certification issues

The Fire Risk Assessment states that the Switchgear Room will require a separate Fire Safety Certificate application and will need to demonstrate compliance with the relevant sections of Technical Guidance Document B 2024. However, the BESS enclosures themselves are treated differently because they are non-walkable and are described as exempt from Building Regulations as *"buildings not frequented by people"*.

The GBWAG submits that this distinction should not lead to a lower level of scrutiny for the BESS containers. The risk profile of the BESS arises not from routine occupation of the containers but from the presence of lithium-ion battery cells, high DC current, inverter equipment, electrical faults, toxic gases, off-gassing, fire propagation, stranded energy and emergency responder safety. A lack of routine occupation does not remove the potential for effects beyond the container itself.

In these circumstances, the Commission should require clear confirmation of all applicable standards, certification, testing, commissioning and third-party verification arrangements for the BESS system, including battery cells, containers, inverters, transformers, fire detection, suppression systems, emergency stops, SCADA systems, alarms, CCTV, signage, hazardous materials information and emergency response procedures.

The GBWAG further submits that the final BESS technology, fire suppression system, fire alarm design, system interfaces and emergency arrangements should not be left to general manufacturer specification or post-consent design. These matters are central to the risk assessment and should be secured through enforceable conditions, independent certification and consultation with the relevant fire authority.

7.16.8 Conclusion on Health, Safety and Fire Risk

The GBWAG submits that the application has not demonstrated, with sufficient certainty, that the health, safety and fire risks associated with the proposed BESS and associated electrical infrastructure have been fully assessed and mitigated at application stage.

The applicant's own Fire Risk Assessment confirms that the BESS facility involves lithium-ion battery technology, high DC current, inverter infrastructure, transformer risks, toxic gas risks, explosive gas risks, DC arc risks, stranded energy risks, firefighter safety risks and environmental risks from toxic smoke and contaminated residues. It further confirms that standard Building Regulation guidance does not adequately deal with this type of unique or unusual lithium-ion container infrastructure and that the BESS enclosures are treated as exempt from Building Regulation compliance as buildings not frequented by people.

The applicant's conclusion that the BESS represents a tolerable fire risk is expressly dependent upon the proper implementation, installation, commissioning, maintenance and operation of monitoring systems, fire detection, suppression systems, emergency stop systems, training, fire service liaison, emergency planning, waste disposal planning and ongoing review. A number of these matters remain to be developed or finalised after planning consent.

In the GBWAG's submission, this level of deferral is not acceptable for a rural large-scale BESS forming part of a major wind energy development. The Commission must be satisfied before granting permission that the risks to residents, emergency responders, the environment and property have been fully assessed and that all mitigation and emergency response measures are clear, enforceable and operationally reliable.

Accordingly, the GBWAG submits that permission should be refused on the basis that the application has not provided sufficient certainty in respect of BESS fire safety, emergency response, toxic gas risk, public warning, environmental protection and firefighter safety.

In the alternative, should the Commission be minded to grant permission, the GBWAG requests that strict conditions be imposed requiring, prior to commencement and/or prior to operation as appropriate:

- a final BESS Fire Safety Strategy;
- confirmation of the final BESS technology and container specification;
- independent certification of fire detection, suppression, SCADA, BMS and emergency stop systems;
- a final Emergency Action Plan prepared in consultation with Tipperary Fire Service;
- a Pre-Incident Plan agreed with the fire authority;
- a site-specific toxic gas and smoke response protocol;
- confirmation of evacuation or shelter-in-place procedures for surrounding receptors;
- public warning and resident notification arrangements;
- firefighting water supply and access strategy;
- contaminated firewater and residue management plan;
- hazardous materials manifest and Safety Data Sheets to be held on site;
- annual fire risk assessment review;
- biennial fire safety audit;
- full training and familiarisation exercises with emergency responders;
- and a requirement that the BESS shall not be commissioned until the planning authority has received written confirmation from a competent fire safety professional that all fire safety, emergency response and environmental protection measures have been installed, tested and certified.

In the absence of such safeguards, the Commission cannot be satisfied that the proposed BESS infrastructure would not give rise to unacceptable health, safety, environmental or residential amenity risks.

7.17 Ground 17: A ten year planning permission is not supported

The applicant seeks a ten-year duration of permission for the proposed development. The GBWAG does not support the granting of an extended ten-year permission in the circumstances of this case. Section 40 of the Planning and Development Act 2000, as amended, provides that, unless a different period is specified, the appropriate period for a planning permission is five years. Accordingly, a five-year duration is the normal statutory period and any extended duration should be clearly justified having regard to the nature, scale, environmental sensitivity and likely construction impacts of the proposed development.

In the present case, the proposed development is located within a sensitive rural receiving environment and within lands expressly identified as unsuitable for wind energy development under the relevant Wind Energy Strategies. The construction phase would give rise to a range of potential effects on local residents and the surrounding environment, including traffic disruption, noise, vibration, dust, construction lighting, temporary works, excavation, access track construction, grid connection

works, drainage works, watercourse protection measures and potential effects on ecological and hydrological receptors. An extended ten-year permission would unnecessarily prolong the period during which local residents and the wider community may be exposed to uncertainty and construction-related impacts.

The GBWAG further submits that the environmental baseline relied upon in the EIAR should not be allowed to remain effectively "live" for a decade without meaningful reassessment. Ecological conditions, ornithological usage, hydrological conditions, traffic patterns, residential occupation, cumulative development, policy context and environmental sensitivities may materially change over such a period. This is particularly relevant in circumstances where the proposed development is already subject to significant concerns relating to landscape sensitivity, ecology, ornithology, noise, shadow flicker, hydrology and residential amenity.

A ten-year duration would also defer the full implementation and verification of mitigation measures for a prolonged period. Many of the measures relied upon by the applicant, including construction management, drainage controls, water protection measures, traffic management, ecological mitigation, noise controls, shadow flicker controls and community complaint procedures, would not be fully tested or implemented until the works are ultimately carried out. Extending the permission period therefore increases uncertainty for residents and weakens the temporal connection between the assessment undertaken at application stage and the environmental conditions existing when construction may eventually commence.

The GBWAG acknowledges that wind energy projects can involve complex procurement, grid connection and construction programming. However, the applicant has not demonstrated that the proposed works cannot reasonably be commenced and substantially completed within the normal five-year period. The mere scale or commercial complexity of the project is not, of itself, a sufficient justification for extending the duration of permission in a manner which increases uncertainty and prolongs potential impacts for the local community.

Accordingly, the GBWAG submits that a ten-year permission is not justified. If the Commission is minded to grant permission, it is respectfully requested that the duration of permission be limited to the standard five-year period. In the alternative, any extended duration should be accompanied by strict requirements for updated environmental surveys, refreshed receptor assessments, updated cumulative impact assessments and renewed confirmation of mitigation measures prior to commencement of development.

7.18 Ground 18: Construction phase concerns (not set out elsewhere in this report)

The following points should not be taken to infer that the GBWAG supports any part of the proposed development. They are advanced strictly without prejudice to the GBWAG's primary position that permission should be refused. The points are included to assist the Commission in its assessment of the overall project and to identify construction phase concerns which would arise in the event that the Commission were minded to grant permission.

This section responds principally to Appendix 2-3 of the EIAR, namely the Construction Environmental Management Plan ("CEMP"), together with associated construction-related commitments contained elsewhere in the application documentation. The GBWAG acknowledges that the CEMP contains a range of proposed mitigation and management measures. However, it is submitted that the CEMP does not provide sufficient certainty, specificity or enforceability having regard to the scale, duration and environmental sensitivity of the proposed development.

The proposed development is not a minor construction project. It comprises an 11-turbine wind farm with turbines up to 180m in height, turbine foundations, hardstands, internal access tracks, borrow pits, spoil management, forestry felling, a 110kV substation, Battery Energy Storage System, four temporary construction compounds, grid connection works, turbine delivery accommodation works and works along public roads and private lands. The construction phase is expected to extend over approximately 24 months and will take place within a rural receiving environment containing residential properties, agricultural activity, local roads, watercourses, peatland, forestry and ecologically sensitive receptors.

7.18.1 Fundamental reliance on an evolving and contractor-led CEMP

The CEMP confirms that it is a "live" document and that it will be reviewed and updated throughout the project. It is stated that the CEMP may be revised to address planning conditions, best practice at the time of construction, pre-construction site investigations, changes resulting from contractor construction methods and unforeseen conditions encountered during construction. It is further stated that the CEMP will be provided to the appointed Main Contractor, who will have responsibility for updating the document as necessary during the construction phase.

The GBWAG submits that this introduces a material degree of uncertainty. While some updating of a CEMP is normal, the extent of the reliance placed on future contractor input in this case is significant. The appointed contractor is required to include further details and confirmation in an updated CEMP, including emergency plan details, personnel and contact numbers, site and traffic signage and method statements. These are not merely administrative details. They are central to how the development will actually be constructed, how incidents will be managed, how residents will be informed, and how environmental safeguards will be implemented.

The CEMP therefore does not operate as a final, standalone and enforceable construction management document. Rather, it functions as a framework document which depends upon later contractor appointment, further method statements, updated procedures, additional monitoring measures and future agreement with statutory bodies or the planning authority. This is particularly concerning given the sensitivity of the site and the range of construction activities proposed, including deep excavations, peat and spoil handling, borrow pit extraction, watercourse crossings, grid trenching, construction traffic, concrete pours, BESS construction and turbine delivery.

The GBWAG does not suggest that no construction-stage detail may ever be finalised post-consent. However, where the CEMP is relied upon as a key mitigation document to support the conclusion that construction effects will be acceptable, the Commission must be satisfied that the measures are sufficiently specific, enforceable and capable of implementation. In the present case, the CEMP leaves too many important matters to later contractor-led refinement.

7.18.2 Construction working hours and protection of residential amenity

The CEMP states that construction operations will be restricted to between 07:00 and 19:00 Monday to Friday, excluding public holidays, and between 07:00 and 14:00 on Saturdays. It then provides for longer hours during critical periods, including turbine foundation concrete pours, turbine installation during suitable weather conditions, delivery of oversized loads and emergencies.

The GBWAG submits that the proposed working hours are excessive in a rural residential context. A 07:00 start, particularly over a 24-month construction period, has the potential to materially affect residential amenity, especially where activities involve HGV movements, reversing alarms, plant start-up, excavation, rock breaking, concrete delivery, grid trenching or traffic management on local roads.

The concern is heightened by the proposed exceptions to normal hours. The CEMP indicates that concrete pours may require extended working because turbine foundation pours must be continuous and may take in excess of 12 hours. It also indicates that turbine delivery and erection may require works outside core hours, including late evening oversized load movements. These exceptions are not isolated or remote. They are integral to the construction of the project.

In the event that permission is granted, the GBWAG submits that construction activity should be more strictly limited to the following hours:

- 08:00 to 18:00 Monday to Friday; and
- 09:00 to 13:00 on Saturdays.

No construction activity, deliveries, site preparation, plant start-up, grid trenching, road works or vehicle movements should be permitted outside these hours, nor on Sundays or public holidays, save in a genuine emergency. Any proposed exceptional out-of-hours works should be subject to prior written approval from the planning authority, advance notice to affected residents, and specific justification. General references to turbine installation weather windows, contractor convenience or concrete programming should not be sufficient to permit routine out-of-hours works.

7.18.3 Absence of a binding and final construction programme

The CEMP includes an indicative construction schedule and identifies a number of overlapping construction phases, including civils, grid connection, site electrical works, turbine delivery and erection, substation commissioning and turbine commissioning. It also indicates that the construction phase will take approximately 24 months from commencement to completion of turbine commissioning.

However, the submitted construction programme is indicative only. It does not provide affected residents with sufficient certainty as to when works will occur in particular parts of the site, when the most disruptive works will take place, when grid connection trenching will affect particular local roads, when concrete pours will occur, when abnormal loads will be delivered, or when works will occur near individual properties.

This is material because the proposed development is geographically extensive and fragmented. Residents may be affected by different construction activities at different times, including site access works, haulage, forestry felling, turbine foundation works, borrow pit activity, grid trenching, road closures, joint bay works, turbine delivery, BESS/substation construction and reinstatement works. The cumulative effect may therefore be prolonged and repeated disruption, even if individual works in a particular location are described as temporary.

If permission were to be granted, a detailed and binding Construction Phasing Plan should be required prior to commencement. This should identify the sequencing, location and expected duration of all major works, including vegetation clearance, access track construction, borrow pit excavation, peat/spoil movement, turbine foundation construction, concrete pours, grid connection trenching, joint bay works, HDD works, road closures, turbine delivery, turbine erection, substation/BESS works and reinstatement. It should also include a requirement for advance resident notification and public availability of a rolling programme of works.

In the absence of such clarity, the Commission cannot be satisfied that construction impacts have been adequately assessed or that affected residents will have meaningful certainty as to the timing and duration of disruption.

7.18.4 Complaints procedure, community liaison and independent oversight

The CEMP includes a general complaints procedure. It provides that complaints will be recorded, categorised and entered into a central Site Complaints Log, and that complaints will be communicated to the Project Manager and Project Developer. It further states that complaints will be followed up and resolved insofar as practicable.

While this is welcome in principle, it is not sufficiently robust for a project of this scale and duration. The CEMP does not identify a named Community Liaison Officer, does not provide a publicly available dedicated contact number, does not set out maximum response times, does not define escalation procedures, does not identify when the planning authority will be notified, and does not provide for independent review of unresolved complaints.

The GBWAG submits that a complaints-led approach is not an adequate substitute for proactive mitigation. However, where complaints do arise, there must be a clear, transparent and enforceable mechanism for resolution. This is particularly important where construction impacts may include excessive noise, dust, traffic disruption, mud on roads, blocked access, out-of-hours activity, light spill, vibration, damage to roads, water quality incidents or impacts on property enjoyment.

If permission were granted, the applicant should be required to appoint a dedicated Community Liaison Officer prior to commencement of development. The Community Liaison Officer should have a publicly available phone number and email address, maintain a weekly updated works programme, issue advance notifications to affected residents, record and publish anonymised complaint statistics, and provide a clear escalation route to the planning authority where complaints are not resolved within a defined timeframe.

The complaints log should be made available to the planning authority on request and should include the nature of the complaint, date and time, location, response provided, mitigation action taken and whether the complaint was resolved. Without such measures, the complaints procedure lacks sufficient transparency and enforceability.

7.18.5 Construction noise, vibration and plant management

The CEMP relies on standard construction management and best practice measures to control construction noise and vibration. However, the proposed construction works include potentially disruptive activities such as excavation, access track construction, turbine foundation works, concrete pours, borrow pit extraction, grid trenching, HDD works, joint bay construction, HGV movements, turbine delivery and crane operations.

The GBWAG submits that construction noise cannot be treated as a routine or minor matter in this rural receiving environment. The construction phase is expected to extend over approximately 24 months and will involve activities in proximity to residential properties, local roads and sensitive environmental receptors. The use of standard guidance and general good practice does not, of itself, demonstrate that construction noise will be acceptable at all affected dwellings.

In the event of permission being granted, a detailed Construction Noise and Vibration Management Plan should be required prior to commencement. This should identify all noise-sensitive receptors, proposed construction activities by location and phase, predicted noise levels for the most disruptive activities, mitigation measures, monitoring locations, reporting procedures and trigger levels for corrective action. Particular attention should be given to out-of-hours works, turbine foundation concrete pours, HGV traffic, grid connection works along public roads and activities close to dwellings.

Specific controls should include restrictions on early morning plant start-up, prohibition on unnecessary idling, use of broadband reversing alarms where appropriate, temporary acoustic screening where works are close to dwellings, advance resident notification for high-noise works, real-time monitoring for the most sensitive phases, and immediate modification or cessation of works where exceedances occur.

Reliance on complaints after noise disturbance has occurred would not provide adequate protection for residential amenity.

7.18.6 Construction lighting and visual amenity

The proposed development will involve a 24-month construction phase, with potential early morning, late evening and winter construction activities, including extended hours for turbine foundation pours, turbine installation, oversized load deliveries and emergency works. In such circumstances, artificial lighting is likely to be required at compounds, access points, turbine work areas, road works, grid connection works and security locations.

The CEMP contains general commitments regarding environmental management and, in the mitigation schedule, construction lighting is addressed principally through ecological controls, including directional, downward-facing and shielded lighting, use of lighting only where required for safety, avoidance of lighting towards woodlands, badger setts and riparian habitats, reduced light levels or motion sensors where bat foraging habitat is present, and switching off non-essential lighting during hours of darkness.

While these measures are useful, the GBWAG submits that the CEMP does not provide a sufficiently detailed Construction Lighting Plan. It does not identify the locations where lighting will be used, the lighting columns or equipment proposed, hours of operation, lux levels, spill contours, likely visibility from dwellings, effects on dark rural skies, or the relationship between lighting and out-of-hours construction activities.

Construction lighting has the potential to affect residential amenity, landscape character, ecological receptors and the rural night-time environment. If permission is granted, a detailed Construction Lighting Plan should be required prior to commencement, including lighting locations, specifications, orientation, timing, lux contours, ecological buffers, residential receptor assessment and procedures for responding to complaints or observed light spill.

No construction lighting should be directed towards dwellings, watercourses, woodland edges, known bat foraging routes, badger setts or sensitive ecological habitats. Lighting should be strictly time-limited, motion-controlled where possible, and switched off when not required for safety.

7.18.7 Dust, Air Quality and Mud on Public Roads

The CEMP includes dust suppression measures, including the use of water bowsters during extended dry weather, damping down of haul roads and compounds, wheel washing, road sweeping, use of tarpaulins and control of stockpiles. These measures are necessary given the extent of earthworks, borrow pit activity, access track construction, grid trenching, vehicle movements and construction compounds proposed.

However, the GBWAG submits that the CEMP remains insufficiently specific in relation to dust monitoring, trigger thresholds and corrective action. The development includes extensive ground disturbance, peat and spoil movement, stone and aggregate handling, construction of internal roads and HGV movements on rural roads. Dust impacts may arise not only within the wind farm site but also along the grid connection route, turbine delivery route, construction haul route, compounds and road works areas.

The local receiving environment is rural and includes dwellings, roads, agricultural lands, vegetation, watercourses and sensitive habitats. Dust and mud have the potential to affect residential amenity, road safety, water quality, vegetation and local businesses or farms. Visual inspections and reactive cleaning measures are not sufficient in themselves.

If permission is granted, the applicant should be required to prepare a detailed Dust and Air Quality Management Plan prior to commencement. This should include receptor-specific monitoring locations, dust deposition monitoring where appropriate, daily inspection requirements during dry weather, defined meteorological trigger conditions, stop-work procedures for uncontrolled dust, road sweeping requirements, wheel wash operation, stockpile controls, complaint response procedures and reporting to the planning authority.

The plan should also require regular inspection of public roads affected by construction traffic and immediate cleaning where mud, debris or dust is deposited. This is particularly important where construction vehicles access the R492, local roads, grid connection works areas and turbine delivery route locations.

7.18.8 Emergency response, peat stability and environmental incidents

The CEMP identifies a range of potential emergency hazards, including spillages and leaks, flooding, severe weather, fire/explosion, turbine collapse, peat stability, landslide, construction traffic incidents and wind turbine rotational failure. It also states that the Contractor will be responsible for developing a detailed environmental Emergency Response Plan as part of the Health and Safety Plan.

The GBWAG submits that the recognition of these hazards is important. However, the emergency response framework remains incomplete at application stage. The emergency contact table includes a number of key roles and contacts which are "to be confirmed following planning process", including the Site Manager, Client/Developer contact, Ecological Clerk of Works, Environmental Manager, Project Supervisor Design Stage, Project Supervisor Construction Stage, Inland Fisheries Ireland, Project Engineer, Project Ecologist, Project Hydrologist, Project Geotechnical Engineer and Project Archaeologist.

This is a significant gap. Emergency response arrangements are central to the protection of residents, watercourses, ecological receptors, peat stability, public roads and construction workers. The Commission should not be asked to rely on an incomplete emergency response structure where key personnel, contact details and response procedures remain to be confirmed after permission.

If permission is granted, no works should commence until a final Emergency Response Plan has been submitted to and approved by the planning authority. This should include named personnel, 24-hour contact details, clear incident escalation procedures, emergency access routes, peat slide response procedures, spill response equipment locations, watercourse protection protocols, fire response arrangements for the BESS and substation, liaison procedures with emergency services, and notification procedures for local residents and relevant statutory authorities.

7.18.9 Conclusion

The GBWAG submits that the CEMP does not provide sufficient certainty or enforceability having regard to the scale, duration and sensitivity of the proposed development. The CEMP is expressly framed as a live and evolving document, relies heavily on the future appointed contractor, and leaves a number of important matters to be confirmed after consent, including method statements, emergency contacts, traffic signage, monitoring arrangements and detailed construction procedures.

In circumstances where the construction phase will extend over approximately 24 months and involve substantial works across a wide rural area, including peat excavation, borrow pits, internal roads, turbine foundations, grid connection trenching, construction traffic, BESS/substation works and abnormal load deliveries, greater certainty is required at application stage.

The GBWAG therefore submits that, if the Commission is minded to grant permission, strict conditions must be imposed requiring a final CEMP, Construction Phasing Plan, Construction Traffic Management Plan, Construction Noise and Vibration Management Plan, Construction Lighting Plan, Dust and Air Quality Management Plan, Emergency Response Plan and Community Liaison Strategy to be submitted and approved prior to commencement. These documents should be independently reviewed where appropriate and should include clear trigger levels, reporting requirements, enforcement mechanisms and stop-work powers.

In the absence of such safeguards, the Commission cannot be satisfied that construction phase impacts on residential amenity, public roads, water quality, ecology, peat stability and the wider rural environment will be adequately controlled.

7.19 Ground 19: Failure to protect residential amenity and private life in accordance with Article 8 of the European Convention on Human Rights

Article 8 of the European Convention on Human Rights guarantees the right to respect for private and family life, the home and correspondence. While Article 8 does not confer an absolute right to prevent development in the vicinity of private homes, it is well established that serious environmental effects which directly interfere with the use, enjoyment, safety or peaceful occupation of a dwelling may engage the protections afforded by Article 8. In the planning context, this requires decision-makers to ensure that the effects of proposed development on residential amenity, health, family life and the enjoyment of the home are properly assessed, transparently disclosed and proportionately addressed before development consent is granted.

In the present case, the proposed development comprises a large-scale industrial wind energy project within a rural receiving environment containing a substantial number of existing residential properties. The development includes turbines of significant height and scale, associated access tracks, cabling, grid connection infrastructure, substation infrastructure, battery energy storage infrastructure and other ancillary works. The nature of the development is such that its effects would not be limited to a short construction period, but would continue throughout the operational life of the project and would materially alter the environmental conditions experienced by residents in their homes and surrounding rural environment.

The GBWAG acknowledges the importance of renewable energy development and the need to support the transition to a low-carbon energy system. However, national renewable energy policy does not displace the obligation to protect residential amenity, human health and the rights of local residents. The proper planning and sustainable development of the area requires a fair balance to be struck between the wider public interest in renewable energy generation and the private rights of individuals and families whose homes are located within the receiving environment of the proposed development.

In this case, the application documentation gives rise to material concerns as to whether that fair balance has been properly assessed. As set out in the preceding grounds of this submission, concerns arise in relation to operational noise, cumulative noise, reliance on extrapolated background noise data, limited compliance margins, shadow flicker, reliance on turbine shutdown mitigation, visual dominance, landscape transformation, construction impacts, grid connection works and the cumulative effect of the proposed development on the established rural residential environment.

Of particular concern is that several of the matters most directly affecting the enjoyment of the home are dependent upon modelling assumptions, future mitigation measures, operational control systems and post-consent refinement. For example, the shadow flicker assessment identifies widespread pre-mitigation exceedances but relies upon future turbine shutdown systems, pre-programmed receptor co-ordinates, updated modelling and resident complaint procedures to achieve "near zero" effects. Similarly, the noise assessment relies upon assumptions concerning background noise conditions, modelling parameters, curtailment and cumulative assessment methodologies. These matters are not peripheral; they go directly to the question of whether residents can continue to enjoy their homes without unacceptable disturbance.

Residents are entitled to understand, before permission is granted, the nature, extent and duration of environmental effects likely to affect their homes and families. This includes clear information regarding predicted operational noise levels, night-time disturbance, cumulative noise, shadow flicker occurrence, visual effects, construction traffic and vibration, grid connection disruption, emergency access and the operation of any BESS or electrical infrastructure associated with the development. Where key mitigation measures are deferred to later stages, or where their effectiveness depends on future modelling, software programming, complaint response or operational adjustment, residents are deprived of certainty as to the environmental conditions that will apply to their homes over the lifetime of the development.

This is particularly significant in a rural context. Residents of the area currently experience a residential environment characterised by rural amenity, relative tranquillity, open landscape character and established patterns of residential occupation. The introduction of industrial-scale turbines and associated infrastructure would fundamentally alter that context. The impact on residents is not confined to any single technical topic, but arises from the combined and cumulative effect of noise, visual change, shadow flicker, traffic, construction disruption, perceived safety concerns and loss of rural amenity.

The procedural dimension of Article 8 is also relevant. Where environmental effects have the potential to materially affect the home and private life, the assessment process must ensure that affected residents have access to sufficient information to understand and participate meaningfully in the decision-making process. In the present case, uncertainty and deficiencies in the assessment of receptor identification, operational noise, cumulative impacts, shadow flicker mitigation and post-consent control measures undermine the ability of residents to fully assess the implications of the proposed development for their homes, families and day-to-day living environment.

The GBWAG submits that the reliance on future mitigation, post-consent modelling and complaints-led adjustment is not an adequate substitute for a robust and transparent assessment at application stage. The Commission must be satisfied, before any permission is granted, that the proposed development will not give rise to a disproportionate interference with the residential amenity, private life and peaceful enjoyment of the homes of nearby residents.

In circumstances where significant uncertainty remains regarding operational noise, cumulative impacts, shadow flicker, visual effects and the effectiveness of proposed mitigation, it is submitted that the proposed development fails to adequately safeguard the rights and legitimate interests of local residents. The granting of permission in the absence of a full, integrated and precautionary assessment of these impacts would risk a disproportionate interference with the rights protected under Article 8 of the European Convention on Human Rights.

Accordingly, the GBWAG submits that permission should be refused. In the alternative, if the Commission is minded to grant permission, it must impose strict, enforceable and independently verifiable conditions to protect residential amenity and private life, including conditions relating to operational noise limits, cumulative noise monitoring, shadow flicker elimination, turbine shutdown logs, complaint response mechanisms, construction management, grid route impacts, emergency procedures and independent compliance reporting.

7.20 Ground 20: Barn Owl Assessment (See appendix 9)

Our client raises significant concerns regarding the adequacy of the applicant's assessment of potential impacts on Barn Owl, a species afforded the highest level of protection under Irish and European legislation and one which is recognised as being of particular sensitivity within the receiving environment. The Ballincor site lies within one of the highest-density Barn Owl areas identified in Ireland, yet concerns arise regarding the adequacy of the baseline surveys, collision risk assessment, breeding season survey coverage, mitigation proposals and the overall robustness of the conclusions reached within the EIAR.

A detailed independent review of the applicant's Barn Owl assessment has been prepared by a specialist consultant and is enclosed at Appendix 9 to this report. The specialist submission should be read as forming part of this objection and sets out detailed grounds concerning compliance with the NPWS scoping requirements, survey methodology, breeding survey coverage, collision risk assessment, internal inconsistencies within the EIAR, and the adequacy of the proposed mitigation and monitoring measures.

Accordingly, our client respectfully requests that An Coimisiún Pleanála have full regard to the specialist Barn Owl submission contained at Appendix 9, together with the conclusions and recommendations contained therein, when assessing the ecological and ornithological implications of the proposed development.

7.21 Ground 21: Equine Industry and Animal Welfare (See Appendix 10)

Our client raises significant concerns regarding the applicant's failure to adequately assess the potential impacts of the proposed development on established equine enterprises located in close proximity to the turbine array, including Wraymount Stud and an Irish Draught horse breeding enterprise. The specialist review identifies material deficiencies in the EIAR's assessment of equine receptors, including the absence of any equine-specific assessment of shadow flicker, noise, vibration, rider safety, breeding impacts and animal welfare, notwithstanding the recognised importance of these enterprises within the Irish bloodstock industry and the conservation of Ireland's native Irish Draught horse.

A detailed independent assessment has been prepared by a specialist consultant and is enclosed at Appendix 10 to this report. The specialist submission should be read as forming part of this objection and addresses, inter alia, deficiencies in the EIAR, the scientific literature relating to equine behaviour and welfare, planning precedent concerning equine enterprises, and the potential implications of the proposed development for horse breeding operations, rider safety and the long-term viability of these established enterprises.

Accordingly, our client respectfully requests that An Coimisiún Pleanála have full regard to the specialist equine assessment contained at Appendix 10, together with its conclusions and recommendations, when assessing the potential impacts of the proposed development on equine welfare, bloodstock enterprises and associated rural economic activity.

7.22 Ground 22: Impact on Material Assets

Our client raises significant concerns regarding the adequacy of the applicant's assessment of the potential impacts of the proposed development on strategically important material assets within the receiving environment. In particular, concerns arise in respect of the treatment of Birr Aerodrome, the internationally significant I-LOFAR radio astronomy facility at Birr Castle, and the Birr Outdoor Education and Training Centre. The specialist review identifies deficiencies in the applicant's

assessment of these assets, including the extent of consultation undertaken, the assessment of operational impacts, and the cumulative effects of the proposed development on their continued operation and strategic value.

A detailed independent assessment has been prepared by a specialist consultant and is enclosed at Appendix 11 to this report. The specialist submission should be read as forming part of this objection and addresses, inter alia, aviation safety, radio frequency interference, impacts on educational and recreational facilities, consultation deficiencies, and the cumulative effects of the proposed development on these nationally and internationally important material assets.

Accordingly, our client respectfully requests that An Coimisiún Pleanála have full regard to the specialist Material Assets assessment contained at Appendix 11, together with its conclusions and recommendations, when assessing the likely effects of the proposed development on strategic infrastructure, public facilities and other material assets within the receiving environment.

7.23 Ground 23: Aviation Safety and Birr Aerodrome (See Appendix 12)

Our client raises significant concerns regarding the potential impacts of the proposed development on aviation safety and the continued safe operation of Birr Aerodrome (ICAO: EIBR), a licensed Irish Aviation Authority aerodrome and Designated Training Organisation located in close proximity to the proposed wind farm. The specialist review identifies concerns relating to the proximity of the proposed turbines to established flight training circuits, obstacle clearance, student pilot operations, visual navigation, turbulence effects, helicopter and emergency service operations, and the adequacy of consultation undertaken by the applicant with the aerodrome operator. The submission further concludes that the applicant failed to meaningfully engage with Ormand Flying Club despite recommendations from both the Irish Aviation Authority and An Coimisiún Pleanála during the pre-application process.

A detailed independent aviation assessment has been prepared by Ormand Flying Club and is enclosed at Appendix 12 to this report. The specialist submission should be read as forming part of this objection and addresses, inter alia, aviation safety, operational impacts, consultation deficiencies, flight training constraints and the implications of the proposed development for the continued operation of Birr Aerodrome.

Accordingly, our client respectfully requests that An Coimisiún Pleanála have full regard to the aviation submission contained at Appendix 12, together with its conclusions and recommendations, when assessing the likely effects of the proposed development on aviation safety, licensed aerodrome operations and the wider public interest.

7.24 Ground 24: Inadequate Assessment of Waste Management Impacts (See Appendix 13)

It is respectfully submitted that the EIAR fails to provide an adequate, robust or verifiable assessment of the waste management implications of the proposed development. The applicant's conclusion that no significant effects on waste / waste management are anticipated is not supported by the assessment presented. In particular, the EIAR relies on a list of licensed waste facilities without demonstrating that those facilities are operational, available, suitable, or capable of accepting the waste streams arising from the development.

As set out in the specialist Waste Management submission enclosed at Appendix 13, the assessment is materially deficient in a number of respects, including the reliance on waste facilities which appear to be closed, unavailable or mischaracterised; the failure to quantify key construction and demolition waste streams; the absence of a proper hazardous waste protocol for the proposed go-unit BESS; the failure to identify any confirmed waste collector or receiving facility; the failure to address relevant consultation responses; and the absence of any assessment against the relevant Regional Waste Management Plans.

The omission of these details is significant. For a project of this scale, the Commission must be satisfied at the assessment stage that waste can be lawfully collected, transported, treated, recovered or disposed of at authorised facilities with available capacity. The EIAR does not establish this. Instead, key matters are either assumed, deferred to later project stages, or omitted entirely. This undermines the applicant's conclusion that waste-related effects would not be significant.

Accordingly, and having regard to the matters detailed in Appendix 13, it is submitted that the EIAR has failed to demonstrate that the proposed development can be delivered without significant adverse waste management impacts. The Commission therefore cannot be satisfied that the proposed development has been adequately assessed in respect of waste management, hazardous waste, construction waste, wastewater disposal and compliance with regional waste policy.

8.0 Conclusion

This objection has examined the proposed Ballincor Wind Farm in detail and has set out, in Section 7 of this Report, a comprehensive and evidence-based series of grounds demonstrating that the proposed development is unacceptable in principle, inadequately assessed, and contrary to the proper planning and sustainable development of the area. While national, regional and local policy supports the delivery of renewable energy, such support is neither unconditional nor automatic. Wind energy proposals must still comply with the adopted Development Plan framework, national planning guidance, EU environmental law, the Habitats Directive, the EIA Directive, and fundamental principles of environmental protection, public safety, residential amenity and proper planning.

A central and overarching conclusion arising from this objection is that the subject lands are not a suitable location for a wind energy development of the scale, form and operational duration proposed. The proposed development is located within lands identified as "Areas Not Deemed Suitable for Wind Energy Development" under the relevant Offaly and Tipperary wind energy policy framework. That designation is not arbitrary. It reflects a plan-led assessment of wind energy suitability having regard to landscape sensitivity, environmental constraints, ecological and ornithological sensitivities, settlement patterns, residential amenity, protected landscapes, heritage considerations and other planning constraints. The applicant has not provided a sufficiently robust or persuasive justification for overriding this adopted spatial strategy.

This is not a modest or discreet renewable energy proposal. The proposed development comprises eleven wind turbines with a maximum tip height of up to 180 metres, together with turbine foundations, crane hardstandings, access tracks, borrow pits, temporary construction compounds, a 110kV substation, Battery Energy Storage System infrastructure, underground cabling, a grid connection route of approximately 12.23 kilometres, joint bays, turbine delivery works, felling, hedgerow removal, drainage infrastructure and associated ancillary works. The proposal would introduce major industrial-scale energy infrastructure into a rural receiving environment containing dispersed dwellings, sensitive habitats, peat and cutover bog lands, watercourses, bird activity corridors, valued landscapes and the wider setting of Birr and the Little Brosna corridor.

The proposed development cannot be regarded as short-term, minor or easily reversible. The application seeks a ten-year permission, a 35-year operational life and permanent permission for the grid connection and substation infrastructure. In practical planning terms, this represents a long-term and partly permanent transformation of the receiving environment. The scale of the turbines, the duration of the permission sought, the permanent nature of certain infrastructure and the extent of associated works materially amplify the significance of the impacts identified throughout this objection.

A consistent theme throughout Section 7 of this Report is the extent to which the application relies on assumptions, modelling parameters, post-consent mitigation, future surveys, monitoring and adaptive management rather than complete, robust and enforceable evidence at application stage. Concerns arise in respect of noise modelling, valley propagation effects, high wind speed background data, shadow flicker receptor identification, hydrology and water quality, peat stability, ornithology, biodiversity, landscape and visual impact, BESS safety, traffic, grid connection works, construction management and cumulative effects. In many instances, the applicant's conclusions depend upon mitigation measures or future refinement which have not been demonstrated to be sufficiently certain, effective or enforceable.

Taken together, these deficiencies mean that An Coimisiún Pleanála is being asked to determine the application in the absence of complete, reliable and verifiable information across multiple environmental disciplines. That approach is not compatible with the precautionary principle, nor with the requirements of EU environmental law where scientific uncertainty remains. Conditions cannot lawfully be used to remedy fundamental gaps in baseline data, to defer the assessment of significant effects, or to resolve uncertainty as to whether impacts can be avoided or mitigated at all.

The proposed development would also materially affect the living environment of nearby rural residents. Impacts would arise from construction traffic, turbine delivery works, grid connection works, noise, shadow flicker, visual intrusion, aviation lighting, operational disturbance, construction-phase disruption and the long-term industrialisation of the surrounding rural landscape. These impacts are not confined to one isolated receptor or one discrete phase of development. They are cumulative, long-term and experienced across homes, local roads, community receptors, sensitive landscapes and rural amenities within the wider receiving environment.

The application further fails to adequately address cumulative and combined effects. The subject proposal must be assessed not in isolation, but in combination with existing, permitted and proposed wind energy development, grid infrastructure, BESS infrastructure, road works and associated environmental pressures in the wider Offaly / Tipperary area. The cumulative burden on landscape character, ornithology, ecology, noise environment, traffic, rural amenity and sensitive receptors has not been adequately or transparently assessed.

The proposal also raises significant procedural and assessment adequacy concerns. These include the repeated lodgement history of the application, design flexibility and absence of a final turbine specification, fragmentation of certain turbine delivery route works, inconsistencies in receptor identification, uncertainty regarding ecological survey timing, reliance on future mitigation, and the need for robust decommissioning and financial security. These matters reinforce the client group's concern that the application is not sufficiently complete, certain or transparent to support a grant of permission.

The claimed benefits of renewable energy generation are acknowledged. However, those benefits do not outweigh the scale of Development Plan conflict, the unsuitability of the site, the extent of unresolved environmental uncertainty, and the likely adverse impacts on landscape, ecology, ornithology, hydrology, residential amenity and rural character. This is not a case where residual effects are minor or capable of being comfortably absorbed by the receiving environment. Rather, the proposal presents a high degree of planning and environmental risk across multiple disciplines.

An Coimisiún Pleanála is not required to permit every renewable energy proposal. National climate policy requires meaningful consideration of renewable energy benefits, but it does not require the grant of permission for development that is poorly sited, inadequately assessed, materially inconsistent with the Development Plan framework, or likely to give rise to unacceptable environmental and residential amenity impacts. The proper planning response in this case is to uphold the plan-led wind energy strategy and refuse permission.

For all of these reasons, and having regard in particular to the detailed grounds set out in Section 7 of this Report and the specialist submissions appended hereto, it is the considered position of our client that the proposed Ballincor Wind Farm

would not constitute the proper planning and sustainable development of the area. An Coimisiún Pleanála is therefore respectfully requested to refuse permission for the proposed development.

8.1 Performance-based planning risk assessment conclusions

In the context of contemporary performance-based planning, it is necessary for An Coimisiún Pleanála to assess not only whether a development is theoretically capable of compliance, but whether, having regard to its location, scale, duration, environmental sensitivity, policy context and evidential basis, it presents an acceptable level of planning risk.

Having reviewed the proposed Ballincor Wind Farm against its receiving environment and the deficiencies identified throughout Section 7 of this Report, the following conclusions arise:

- There is a **significant planning risk** that the proposed development is fundamentally unsuited to its location, having regard to the fact that the lands are identified within the Offaly and Tipperary Wind Energy Strategies as lands not deemed suitable for wind energy development.
- There is a **significant planning risk** that the applicant has failed to demonstrate why the adopted Development Plan strategy, which identifies the lands as unsuitable for wind energy development, should be set aside in favour of the proposed development.
- There is a **significant planning risk** that the proposal represents an excessive concentration of industrial-scale energy infrastructure within a sensitive rural receiving environment characterised by dispersed residential development, ecological constraints, valued landscapes and environmental sensitivities.
- There is a **significant planning risk** that the iterative design evolution of the project, including the removal of turbines, revised layouts, additional buffers and successive mitigation measures, demonstrates the existence of substantial environmental constraints rather than the suitability of the site for wind energy development.
- There is a **significant planning risk** that the noise assessment understates likely impacts through the cumulative effect of multiple favourable modelling assumptions, including the adoption of upper threshold limits, selected ground absorption values, receiver heights and limited seasonal survey data.
- There is a **significant planning risk** that the omission of any assessment of valley propagation effects, notwithstanding the topographical characteristics of the receiving environment and the requirements of recognised industry guidance, has resulted in an underestimation of noise impacts at a number of residential receptors.
- There is a **significant planning risk** that compliance conclusions in relation to operational noise become increasingly dependent upon extrapolated rather than measured background noise data at the very wind speeds where turbine sound power outputs are at their highest.
- There is a **significant planning risk** that the application has failed to clearly demonstrate consistency with Development Management Standard DMS-109 of the Offaly County Development Plan, including the requirement to have regard to the World Health Organisation Environmental Noise Guidelines for the European Region.
- There is a **significant planning risk** that shadow flicker impacts have been underestimated, having regard to inconsistencies in receptor identification, the scale of pre-mitigation exceedances identified by the applicant's own modelling, and the reliance placed upon future operational shutdown systems to achieve compliance.
- There is a **significant planning risk** that residential amenity would be adversely affected through the combined impacts of noise, shadow flicker, visual dominance, aviation lighting, construction activity, traffic movements and the long-term industrialisation of the surrounding rural landscape.
- There is a **significant planning risk** that the ecological and ornithological baseline is incomplete and that the application has not adequately assessed collision risk, displacement effects, cumulative impacts and effects on SPA-linked bird populations and associated ecological receptors.
- There is a **significant planning risk** that cumulative ornithological effects arising from existing, permitted and proposed wind energy developments within the wider area have not been fully assessed or quantified.
- There is a **significant planning risk** that the hydrological, hydrogeological and water quality assessments rely excessively on mitigation, management plans and construction-stage controls, resulting in uncertainty regarding likely effects on watercourses, aquatic habitats and downstream receptors.
- There is a **significant planning risk** that peat disturbance, excavation works, spoil management and associated construction activities could give rise to environmental impacts which have not been fully characterised or quantified.
- There is a **significant planning risk** that the landscape and visual effects of the proposed development have been underestimated and that the proposal would result in a substantial and irreversible transformation of the character of the receiving environment over a prolonged period.

- There is a **significant planning risk** that the cumulative and combined effects of the proposed development, when assessed alongside existing and permitted wind energy developments, associated grid infrastructure and other projects within the wider area, have not been fully evaluated.
- There is a **significant planning risk** arising from the extensive reliance placed upon future surveys, monitoring, adaptive management, construction-stage plans, operational controls and post-consent mitigation measures to resolve uncertainties which remain at application stage.
- There is a **significant planning risk** that the proposal has not demonstrated compliance with the precautionary principle, particularly where uncertainty remains in relation to ecology, ornithology, hydrology, noise, cumulative effects and long-term environmental impacts.
- There is a **significant planning risk** that the application documentation does not provide sufficient certainty to enable the competent authority to conclude, beyond reasonable scientific doubt, that significant adverse environmental effects can be avoided throughout the construction, operational and decommissioning phases of the development.
- There is a **significant planning risk** that the proposed development materially conflicts with the adopted Development Plan framework, including policies and objectives relating to wind energy strategy, landscape protection, ecology, ornithology, residential amenity, environmental protection and the achievement of a reasonable balance between renewable energy development and environmental safeguards.
- There is a **significant planning risk** that approval of the proposed development would undermine the integrity of the plan-led approach adopted through the Offaly and Tipperary Wind Energy Strategies and weaken the practical effect of lands designated as unsuitable for wind energy development.

Having regard to the cumulative effect of the risks identified above, our client submits that **the proposed development presents an unacceptably high planning, environmental and legal risk**. The scale of Development Plan conflict, the environmental sensitivities of the receiving environment, the deficiencies identified across multiple technical disciplines, and the extent of uncertainty remaining within the application documentation collectively demonstrate that the proposal has not been shown to constitute the proper planning and sustainable development of the area.

Accordingly, An Coimisiún Pleanála is respectfully requested to refuse permission for the proposed Ballincor Wind Farm.

9.0 Recommendation

Arising from the above, BPS recommends that the Commission refuse planning permission for the reasons given in Section 9.1 of this Planning Objection Report.

9.1 Recommended reasons for refusal of planning permission

If An Coimisiún Pleanála decides to refuse permission for the proposed development, the following refusal reasons could be applied:

1. Having regard to the location of the proposed development on lands identified under the Offaly County Development Plan 2021–2027, the Offaly County Wind Energy Strategy, the Tipperary County Development Plan 2022–2028 and the Tipperary Renewable Energy Strategy as lands not deemed suitable for wind energy development, and having regard to the scale of the proposed development comprising eleven turbines up to 180 metres in tip height, together with associated grid, substation, BESS and ancillary infrastructure, it is considered that the proposed development would materially contravene the adopted Development Plan framework for wind energy development. The proposed development would undermine the plan-led approach to renewable energy development, would fail to achieve a reasonable balance between renewable energy generation and environmental protection, and would therefore be contrary to the proper planning and sustainable development of the area.
2. Having regard to the location of the proposed development within an environmentally sensitive rural receiving environment, including peat and cutover bog lands, wet grassland, drainage channels, watercourses, the Little Brosna River corridor, nearby callows, ecological corridors and lands of recognised landscape and environmental sensitivity, it is considered that the applicant has failed to demonstrate that the subject site is capable of accommodating wind energy development of the scale proposed without unacceptable adverse effects on environmental receptors. The proposed development would therefore be premature and contrary to the proper planning and sustainable development of the area.
3. Having regard to the deficiencies identified in the applicant's consideration of alternatives and site selection, including the failure to provide a robust comparative assessment of alternative suitable sites and the failure to adequately explain why lands already identified as unsuitable for wind energy development were selected, it is considered that the application does not comply with the requirements of the EIA Directive in respect of reasonable alternatives. The proposed development would therefore be contrary to the proper planning and sustainable development of the area.

4. Having regard to the scale, height and extent of the proposed turbines, the sensitivity of the receiving landscape, the wider Birr / Little Brosna landscape setting, the relationship with scenic approaches, rural dwellings, protected views, Areas of High Amenity and tourism / recreational landscapes, it is considered that the proposed development would constitute an unduly prominent, visually dominant and industrialising form of development which would seriously injure the landscape character, visual amenities and rural character of the area. The proposed development would therefore be contrary to the landscape protection objectives of the relevant Development Plans and contrary to the proper planning and sustainable development of the area.
5. Having regard to the applicant's own iterative design process, including turbine removal, layout revisions, buffers and mitigation measures introduced in response to ornithological, visual, archaeological, hydrological and residential constraints, it is considered that the site contains substantial inherent environmental constraints and has not been demonstrated to be naturally suited to large-scale wind energy development. The proposed development would therefore represent an inappropriate form of development at this location and would be contrary to the proper planning and sustainable development of the area.
6. Having regard to the scale of the proposed development, the proximity of noise-sensitive receptors, the methodological concerns arising from the noise assessment, including the cumulative selection of favourable modelling assumptions, limited seasonal background noise data, reliance on extrapolated high-wind-speed values, uncertainty regarding BG+5 compliance and the absence of an adequate assessment of valley propagation effects, it has not been demonstrated that the proposed development would not give rise to unacceptable noise impacts on nearby residential properties. The proposed development would therefore seriously injure residential amenity and would be contrary to the proper planning and sustainable development of the area.
7. Having regard to the requirements of Development Management Standard DMS-109 of the Offaly County Development Plan 2021–2027, including the requirement to consider human health in relation to noise disturbance and consistency with the World Health Organisation 2018 Environmental Noise Guidelines for the European Region, it is considered that the applicant has failed to clearly demonstrate compliance with the applicable Development Management Standard. The proposed development would therefore conflict with the Development Plan and would be contrary to the proper planning and sustainable development of the area.
8. Having regard to the applicant's shadow flicker assessment, including discrepancies in receptor identification, the identification of extensive pre-mitigation exceedances of the 30 minutes per day and 30 hours per year thresholds, and the reliance placed on future operational shutdown systems, updated modelling and post-consent controls, it has not been demonstrated that all affected receptors have been fully identified or that shadow flicker impacts would be avoided with the necessary degree of certainty. The proposed development would therefore be seriously injurious to residential amenity and contrary to the proper planning and sustainable development of the area.
9. Having regard to the ornithological sensitivity of the receiving environment, including the relationship with the Little Brosna Callows SPA, Dovegrove Callows SPA, wintering bird assemblages, whooper swan feeding areas, SPA qualifying interest species and Annex I species, and having regard to concerns regarding survey methodology, baseline completeness, collision risk modelling, displacement, barrier effects and cumulative collision mortality, it has not been demonstrated that the proposed development would not have unacceptable effects on ornithological receptors. The proposed development would therefore be contrary to the proper planning and sustainable development of the area.
10. Having regard to the ecological sensitivity of the site and wider receiving environment, the presence of peatland, wet grassland, drainage channels, hedgerows, treelines, watercourses and habitats capable of supporting protected species, and having regard to concerns regarding survey adequacy, ecological baseline, mitigation certainty, grid route assessment, bat and bird interactions and invasive species management, it has not been demonstrated that the proposed development would not result in unacceptable effects on biodiversity and ecological receptors. The proposed development would therefore be contrary to the proper planning and sustainable development of the area.
11. Having regard to the hydrological, hydrogeological, peat stability, flood risk and water quality concerns identified, including the sensitivity of the Little Brosna River corridor, the presence of peat and cutover bog lands, flood-prone lands, drainage pathways, watercourse crossings, trenching, HDD works, excavation, access tracks and hardstanding areas, it has not been demonstrated that the proposed development would not give rise to unacceptable impacts on water quality, hydrological function, aquatic habitats, downstream receptors or connected ecological receptors. The proposed development would therefore be contrary to the proper planning and sustainable development of the area.
12. Having regard to the reliance placed on surface water management measures, construction environmental management measures, peat stability controls, monitoring, adaptive management and other mitigation measures requiring further refinement post-consent, it is considered that the application has failed to demonstrate, at application stage, that the proposed development can be constructed, operated and decommissioned without unacceptable environmental effects. The proposed development would therefore be premature and contrary to the precautionary principle and the proper planning and sustainable development of the area.
13. Having regard to the potential effects of the proposed development on European sites, including hydrological, ecological and ornithological pathways, and having regard to the concerns raised in respect of the Natura Impact Statement, ornithological assessment, hydrological assessment, mitigation certainty and cumulative effects, An Coimisiún Pleanála cannot be satisfied, beyond reasonable scientific doubt, that the proposed development, either

individually or in combination with other plans or projects, would not adversely affect the integrity of any European site having regard to its conservation objectives. In such circumstances, permission is precluded under Article 6(3) of the Habitats Directive.

14. Having regard to the scale and extent of peat excavation, soil disturbance, spoil management, borrow pit reinstatement, access track construction and turbine foundation works, and having regard to the uncertainty regarding peat stability, excavation stability, carbon impacts, hydrological interaction and the effectiveness of mitigation, it has not been demonstrated that the proposed development would not give rise to unacceptable effects on peat, soils, land stability, water quality and carbon storage. The proposed development would therefore be contrary to the proper planning and sustainable development of the area.
15. Having regard to the traffic, access and grid connection implications of the proposed development, including abnormal indivisible loads, turbine delivery route constraints, construction traffic volumes, local road capacity, grid connection trenching, joint bays, road openings, diversions, emergency access and reliance on future road opening licences, contractor method statements and traffic management plans, it has not been demonstrated that the proposed development would not give rise to unacceptable impacts on the local road network, traffic safety, residential amenity and community access. The proposed development would therefore be premature and contrary to the proper planning and sustainable development of the area.
16. Having regard to the inclusion of Battery Energy Storage System infrastructure and associated electrical equipment, and in the absence of sufficient site-specific information regarding fire safety, thermal runaway risk, toxic gas dispersion, contaminated firewater management, emergency response, evacuation, public warning, fire service capacity and operational incident management, it has not been demonstrated that the proposed development would not give rise to unacceptable risks to public safety, residential amenity or environmental protection. The proposed development would therefore be premature and contrary to the proper planning and sustainable development of the area.
17. Having regard to the cumulative and combined effects of the proposed development in conjunction with existing, permitted and proposed wind energy developments, grid infrastructure, BESS infrastructure and associated works in the wider area, and having regard to the potential combined effects on landscape character, ornithology, ecology, noise, traffic, water quality, residential amenity and sensitive environmental receptors, it is considered that the cumulative impact assessment is inadequate and understates the likely overall environmental impact of the proposal. The proposed development would therefore be contrary to the proper planning and sustainable development of the area.
18. Having regard to the absence of a final turbine specification and the extent of design flexibility sought in respect of turbine height, rotor diameter, hub height and final layout parameters, it has not been demonstrated that the EIAR, NIS and supporting assessments robustly assess the worst-case scenario for each relevant environmental discipline, including noise, shadow flicker, landscape and visual impact, ornithology, collision risk, aviation, transport and residential amenity. The proposed development would therefore be premature and contrary to the proper planning and sustainable development of the area.
19. Having regard to the proposed ten-year permission period, 35-year operational life and permanent grid connection and substation infrastructure, and in the absence of adequate justification for an extended permission period and permanent ancillary infrastructure within an unsuitable and environmentally sensitive location, it is considered that the proposed development would result in prolonged construction risk, long-term environmental uncertainty and an unacceptable planning precedent. The proposed development would therefore be contrary to the proper planning and sustainable development of the area.
20. Having regard to the scale, nature and duration of the proposed development, including eleven turbines up to 180 metres, BESS infrastructure, permanent substation and grid connection works, and having regard to the absence of adequate decommissioning security, financial bond, parent company guarantee or enforceable financial mechanism to secure full site reinstatement, it has not been demonstrated that the proposed development would be properly decommissioned or that the receiving environment would be restored following cessation of use. The proposed development would therefore be contrary to the proper planning and sustainable development of the area.
21. Having regard to the cumulative effect of the foregoing deficiencies, including Development Plan conflict, site unsuitability, incomplete assessment, uncertainty regarding mitigation, likely impacts on residential amenity, landscape, ecology, ornithology, hydrology, traffic and public safety, it is considered that the proposed development would represent an unacceptable planning, environmental and legal risk. The proposed development would therefore be contrary to the proper planning and sustainable development of the area.
22. In the absence of an impact assessment on agricultural land arising from this wind development, An Comisiún Pleanála is not satisfied that that the proposed development would not be contrary to the proper planning and sustainable development of the area.

Signed:

Brendan Buck

BPS Planning Consultants LTD
Members of the Irish Planning Institute
2 July 2026

APPENDIX 1: Noise

Chapter 7: Noise

Appendix 7-1 Allegro Acoustics Consultant report

Appendix 7-2 Independent Regression Analysis of the Background Noise Survey

Appendix 7-3 IoA GPG 4.3.9 Valley Correction — Full JOULE Formula Workings

7.0 Introduction

Noise is the single greatest day-to-day impact a wind farm imposes on the community that lives around it. Operational noise is the impact that enters the bedroom at night, that determines whether a garden can be enjoyed on a still afternoon, and that defines for the next thirty-five years, whether a home remains a home. Of all the chapters in the Applicant's EIAR, the noise chapter is the one on which An Coimisiún Pleanála's determination bears most directly on the lived environment of the people who will experience this development.

The legal context has shifted. In *Webster & Rollo v Meenacloghspar (Wind) Limited* [2024] IEHC 136, Ms Justice Emily Egan held that noise from a wind farm in Co. Wexford amounted to an unreasonable interference with the enjoyment of neighbouring properties and that compliance with specific decibel limits in a planning permission is not a complete answer to a nuisance claim where the permission regulated noise only by reference to numerical levels, without engaging with the full range of matters that determine whether residents can in fact live in their homes. That judgment does not stand alone. The Supreme Court's earlier decision in *Balz v An Bord Pleanála* [2019] IESC 90 quashed a planning permission for a Cork wind farm on related grounds. A pattern is emerging in which the courts are signalling that questions of residential amenity and noise nuisance ought to be resolved with rigour at the planning stage, rather than left to be litigated, property by property, after a development is built and operating.

The point is straightforward: noise is not a peripheral environmental matter. It is a determinant of health and of whether a home is liveable, it is increasingly recognised as such by the courts and by public-health policy, and it therefore demands the highest level of scrutiny at the determination stage. The sections that follow apply that scrutiny.

Section 7-2 sets out the regulatory framework against which the assessment must be measured, including the direction of travel in Irish noise policy. Section 7-3 describes what the applicant did, the assessment as submitted and identifies the permissive choices through which headroom was built. Section 7-4 sets out what the applicant did not do: the omissions and unaddressed matters that, individually and collectively, undermine the assessment's conclusions and its demonstration of compliance. Three appendices accompany and form part of this submission, and are referenced at the relevant points.

Principal Grounds of Objection — Summary

This submission identifies a series of deficiencies in the noise assessment (EIAR Chapter 11 and Appendices 11.1–11.9) which, individually and cumulatively, mean that the assessment does not provide An Coimisiún Pleanála with a sound basis on which to determine the application on noise grounds. Each ground is established from the applicant's own documents and the methodology the applicant itself adopted as governing. They are summarised here and developed in full in the sections that follow.

1. A pattern of permissive choices that leaves no margin for error. At every stage where the governing methodology permitted a choice, the applicant selected the option most favourable to demonstrating compliance — the most permissive daytime threshold, the lowest-precaution ground and receiver-height parameters, a summer-only survey, and the scoping-out of cumulative effects. Each choice may be defensible in isolation; their uniform direction is not. The cumulative effect is an assessment operating at the very outer edge of what the standards allow, with no capacity to absorb the correction of any step that was required but not performed. (*Section 7.3*)

2. The mandatory valley correction was never performed. The IoA Good Practice Guide, adopted by the applicant as governing, requires at Section 4.3.9 a +3 dB correction (at the applicant's chosen ground factor $G=0.5$) wherever sound propagates across a concave or "valley" ground profile — assessed per turbine, per receptor via the JOULE formula. An exhaustive search of all nine noise documents returns no occurrence of the correction, the formula, or its defining terms. This is the precise

terrain the correction exists to address: turbines on a bog platform with receptors on rising ground above them. The omission of a mandatory assessment step — independently corroborated by Allegro Acoustics (Comment 5) — is outcome-determinative: applying the correction to the applicant's own figures reverses the compliance position at properties presented as compliant, producing confirmed night-time exceedances at eleven residential properties (Appendix 7-3). (Section 7.4.1)

3. The background survey is built on data the instruments could not reliably measure. Across all six night-time monitoring locations, between 85% and 96% of recorded data points fall below the Rion NL-52's 25 dB measurement floor. The applicant's own Table 11-10 derives background levels as low as 17.8 dB — far below the level at which the instrument is specified to measure. The background curves that set every noise limit in the assessment are therefore fitted, in large part, to data the instrument was not capable of recording, producing limits more permissive than the true acoustic environment warrants. (Section 7.4.2)

4. Consistency with the Offaly County Development Plan (DMS-109) is not demonstrated. A substantial part of the development lies within County Offaly, where Development Management Standard DMS-109 requires demonstrated consistency with the WHO 2018 Environmental Noise Guidelines. The assessment engages WHO 2018 only to argue against applying it, and produces no Lden calculation at any receptor. Whether or not the applicant's critique of the Lden metric has merit, DMS-109 is an adopted development-plan standard; the obligation is to assess against it, not to explain why it should not apply. On the documents submitted, the Commission cannot determine whether the development is consistent with the statutory development plan on noise grounds. (Section 7.2.6 and 7.4)

5. The propagation model is applied outside its validated range, in the direction of under-prediction. Every predicted level derives from ISO 9613-2, the method the applicant selected. The general method is validated for low source heights and distances to approximately 1,000 m, within which it states an accuracy of about ± 3 dB; the 98.5 m hub height and the more distant receptors fall outside that envelope. The 2024 Annex D extends the method to tall turbines but does not supply the valley correction (Ground 2). Under the stable nocturnal conditions characteristic of midland raised bog — coinciding with the night-time limit period — the established literature

indicates error toward under-prediction, compounded by a roughness-length value that overstates wind-speed reduction at the heights where compliance is tightest. (Section 7.4.3)

6. Cumulative night-time exceedances predicted by the applicant's own model were scoped out, not assessed. The applicant's model predicts night-time exceedances of the WEDG 2006 fixed limit at six non-stakeholder properties (H060, H071, H081, H100, H209 and H281), and dismisses all six under the IoA GPG Section 5.1.5 scoping rule. That rule is a scoping device applied here, wrongly, at the results stage; and it cannot discharge the planning authority's distinct statutory duty under the EIA Directive to assess the cumulative environment as residents will actually experience it. That a neighbouring wind farm is the dominant source does not make Ballincor's contribution acceptable — it means Ballincor is adding to an environment that already exceeds the limit. (Section 7.4.5)

7. Internal inconsistencies leave the predictions unreliable on their own terms. The assessment applies measurement uncertainty in two contradictory directions — as a +2 dB uplift said to guarantee conservative predictions, and again at the compliance-check stage to excuse near-limit results. (Section 7.4.4)

8. Specific monitoring locations setting the most critical limits are the least reliable. NML6 — which sets the limits for the most exposed western receptors — returns the weakest regression fit of any location (daytime $R^2 = 0.335$) despite the most aggressive directional filtering, including the removal of northerly sectors for which no acoustic basis is stated. At NML4, the instrument was relocated to an undocumented position with no supporting analysis. The locations most critical to the assessment are those whose baselines are least secure. (Sections 7.4.2.1, 7.4.2.2 and 7.4.6)

9. Amplitude modulation, low-frequency noise, monitoring and mitigation are inadequately addressed. The site meets the recognised preconditions for excessive amplitude modulation, yet the matter is deferred to a post-commissioning complaints protocol rather than controlled by condition; no assessment against an established low-frequency criterion is provided; the curtailment relied upon at the nearest receptor is an unverified outline; and no independent Noise Compliance Monitoring Programme has been submitted. (Sections 7.4.7 and 7.4.8)

7.1 The Pattern That Runs Through This Assessment

Before setting out the individual findings it is important to describe the pattern that connects them because that pattern is central to this review. At every point in the assessment where the governing methodology offered a range of permissible choices, the applicant selected the option most favourable to demonstrating compliance.

The daytime noise threshold under WEDG 2006 is a range of 35 to 40 dB for low-noise environments; the applicant chose the highest option, 40 dB, without site-specific justification and despite a background survey showing the true acoustic environment is quieter than the lowest level the instruments could reliably record - the lower option 35db was more appropriate. The ground absorption value used in the noise model ($G=0.5$) produces lower predicted noise levels than the alternative ($G=0.0$); and that same choice independently doubles the magnitude of the mandatory valley correction, which was then omitted altogether. The background survey was conducted entirely in summer, the season of lowest wind speeds in Ireland, so background levels at the wind speeds where compliance is tightest are not measured at all, but extrapolated from a curve. The modelling receiver height was set at 4 metres, which reduces predicted levels relative to a realistic receptor height. Cumulative exceedances were scoped out under an acoustics rule rather than assessed.

Each of these choices is, taken alone, within the range the relevant standard permits. The significance lies in the pattern. When every available choice is made in the same direction - always more permissive, never more cautious — the cumulative effect is to consume every margin the methodology was designed to build in. The assessment is left operating at the very outer edge of what the standards allow with nothing in reserve to absorb the correction of any step that was required but not performed. As the sections below show, the assessment does contain such steps and require correction. Having taken every available advantage, the assessment leaves itself no capacity to absorb the consequence of having done so incompletely. There is no margin for error.

7-2 The Regulatory Framework

A noise assessment for a wind farm of this scale is governed by a layered framework of national guidance, international standards, and statutory development-plan policy. The applicant's own assessment cites each of the documents below as governing or relevant. They are set out here because the findings in Sections 7-3 and 7-4 are measured against them.

7.2.1 Wind Energy Development Guidelines 2006 (WEDG 2006)

The Wind Energy Development Guidelines 2006, issued under Section 28 of the Planning and Development Act 2000, are the principal national guidance governing wind farm noise in Ireland. They set a daytime noise limit in the range of 35–40 dB LA90 for low-noise environments and a fixed night-time limit of 43 dB LA90, with an alternative of background plus 5 dB where that is higher. WEDG 2006 is the framework the applicant has adopted and against which it claims compliance.

7.2.2 IoA Good Practice Guide (2013)

The Institute of Acoustics Good Practice Guide to the Application of ETSU-R-97 (2013), together with its Supplementary Guidance Notes, is the methodological standard adopted by the applicant's acoustic consultants for the background survey, noise-limit derivation, and prediction. The Guide is cited throughout Chapter 11. Two of its provisions are central to this submission: Section 2.5 which governs the conduct of the background survey, and Section 4.3.9, which requires a mandatory correction for sound propagating across a concave or “valley” ground profile. Both are addressed in Section 7-4.

7.2.3 ETSU-R-97

ETSU-R-97 (1996) is the underlying UK assessment method that the IoA Good Practice Guide exists to apply. It establishes the background-plus-margin approach to wind farm noise limits that WEDG 2006 reflects. It is relevant here principally as the source of the methodology the applicant adopted.

7.2.4 ISO 9613-2

ISO 9613-2 is the international standard for the calculation of outdoor sound propagation, and is the algorithm underlying the applicant's noise model. Its stated accuracy is approximately ± 3 dB, and it was validated for source heights up to 30 metres and propagation distances up to 1,000 metres.

7.2.5 BS 4142:2014+A1:2019 and WHO Environmental Noise Guidelines (2018)

BS 4142:2014+A1:2019 provides the established framework for rating the character and impact of industrial and commercial sound, including the assessment of acoustic features such as tonality and impulsivity. The WHO Environmental Noise Guidelines for the European Region (2018) treat wind turbine noise as a distinct health stressor and recommend protective levels stricter than those in WEDG 2006. The WHO Guidelines are not merely advisory in this case: as set out below, they are given domestic planning force through the Offaly County Development Plan.

7.2.6 Offaly County Development Plan — Development Management Standard DMS-109

The Ballincor site straddles the Tipperary/Offaly county boundary, and a substantial portion of the development; turbines, noise-sensitive receptors, and associated infrastructure, lies within County Offaly. The Offaly County Development Plan 2021–2027, at Development Management Standard DMS-109, requires that wind energy development demonstrate consistency with the WHO 2018 Environmental Noise Guidelines as a condition of planning assessment. DMS-109 carries the weight of adopted development-plan policy. The applicant's assessment is therefore required to demonstrate WHO 2018 consistency for the Offaly portion of the project. As Section 7-4 sets out, no such demonstration appears anywhere in the submission.

7.2.7 The Direction of Travel — Why the Highest Scrutiny Is Warranted Now

WEDG 2006 is not a settled or future-proof standard. It was written for turbines of 60–80 m tip height and 1–2 MW capacity. The Ballincor turbines are 180 m to tip and 5.7 MW each — machines of a class that did not exist when the guidance was drafted. The

Government has committed through successive Climate Action Plans to replacing WEDG 2006, and the framework is under active ministerial review.

The shape of the replacement is already known. The draft Revised Wind Energy Development Guidelines, published for public consultation in December 2019, propose a noise regime materially more stringent than WEDG 2006. The draft introduces a Relative Rated Noise Limit (RRNL) of 5 dB(A) above background within a range of 35–43 dB(A), with 43 dB(A) the maximum permitted day or night, and a 35 dB(A) floor at very quiet locations where background falls below 30 dB. The draft regime would also, for the first time, impose explicit rating penalties of up to 11 dB(A) for special audible characteristics, tonal noise and amplitude modulation, together with a fixed threshold for low-frequency noise, and would require cumulative assessment against all adjacent existing, consented, and proposed turbines rather than permitting acoustic scope-out.

These proposed Guidelines cannot be invoked as the governing standard for this application, and this submission does not ask An Coimisiún Pleanála to apply them. The point is one of context and direction. A development permitted now under WEDG 2006 will, on any realistic timetable, be commissioned and operating into a period in which the revised, stricter regime is the national standard. The features the revised regime is specifically designed to control - amplitude modulation, low-frequency noise, very low background environments, and cumulative effects — are precisely the features that arise most wh at this site. Where the courts have signalled that noise nuisance should be resolved at the planning stage, where national policy is moving decisively toward stricter protection and where local policy (Offaly CDP) has established a DMS to support it, the appropriate response is to *at a minimum* hold the present assessment to the most rigorous reading of the standards that currently govern it. That is the standard applied throughout this submission.

7.3. The Applicant's Assessment — What Was Done, and How Headroom Was Built

This section describes the assessment as submitted and identifies at each stage the methodological choices through which compliance margin was created. None of the individual choices below is, in isolation, outside the range the relevant standard permits. They are set out together because their direction is uniform and because their cumulative effect, as Section 7.1 explained, is to leave the assessment with no margin to absorb the omissions identified in Section 7-4.

7.3.1 The Background Noise Survey

Background noise levels were derived from a survey at seven monitoring locations (NML1–NML7) using Rion NL-52 Class 1 sound level meters. Several features of how the survey was conducted point in the same direction. The first is to raise the derived background, and with it the permitted limit, above what the true environment warrants. The second is that the survey generates no measured background at the wind speeds that matter most and the assessment moves from a fixed floor baseline and switches to the Background+5db baseline when necessary and convenient.

7.3.1.1 Summer-Only Survey and the High Wind Speed Gap

All seven locations were surveyed between July and September 2022 (NML7 anomalously continued until August 2023, unexplained). Summer is the season of lowest wind speeds in Ireland, and the survey accordingly captured very little data at the higher wind speeds at which the turbines are loudest and compliance is tightest. Background levels at 8 and 9 m/s appear in parentheses throughout the applicant's Table 11-10, the applicant's own notation for values extrapolated from the regression curve rather than read from measured data.

This gap is corroborated the Independent expert consultants, Allegro Acoustics (Appendix 7-1). They record in Comment 1 that the derived background levels lack data for wind speeds above 9 m/s, that the assessment provides no predicted noise

levels above 9 m/s to demonstrate compliance, and that publicly available technical data for the Nordex N163 indicates cut-out wind speeds up to 26 m/s. Compliance above 9 m/s is simply not demonstrated, and the limits in that range rest on extrapolated rather than measured background. Ultimately, compliance at the worst case is assessed against an extrapolated curve not reliable available data.

7.3.1.2 Compressed Data and Consistently Low Background Readings

The Rion NL-52 has a manufacturer-specified A-weighting measurement floor of 25 dB and an inherent self-noise of 17 dB or less. In a genuinely quiet rural environment the true background can fall well below 25 dB but the instrument cannot record it accurately there. Below the floor, readings are compressed between the instrument's own self-noise and its lower measurement limit and are pulled upward toward the floor rather than reflecting the true quiet. The consequence is a regression curve that sits higher than the real acoustic environment, and, under the background-plus-5 dB framework, a noise limit more permissive than the true environment warrants.

Appendix 7-2 Independent Regression Analysis of the Background Noise Survey, based entirely on the Applicant's own data captures the scale of this issue. Across the six night-time monitoring locations, between 85% and 96% of all recorded samples fall below the 25 dB floor — at NML2, only 27 of 760 night-time samples are above it. The applicant's own Table 11-10 derives background levels as low as 17.8 dB, fully 7.2 dB below the level at which the instrument is specified to measure reliably. The background curves that set the limits are therefore fitted, in large part, to data the instrument was not capable of recording. Allegro Acoustics, independently reference records measuring background as low as 23.9 dB by day and 18.8 dB by night — themselves below the instrument floor — confirming the extreme quiet of the receiving environment on which this finding turns. The full quantification, the location-by-location breakdown, and the digitised regression analysis are set out in Section 4.3 and Appendix 7-2.

7.3.1.3 Regression Analysis and Directional Filtering

The derived background curves were produced by fitting regressions of measured noise against standardised wind speed, after directional filtering intended to remove

the contribution of the neighbouring Lacka/Skehanagh wind farm. The filtering, the regression fit quality, and the unexplained exclusions are addressed in Section 4.3. The relevant point for this section is that the curve-fitting process, operating largely on sub-floor data, is the mechanism by which the permissive background levels were generated.

7.3.2 The Noise Limit Framework — Thresholds Set High Against the Lowest Background

WEDG 2006 permits a daytime limit anywhere in the 35–40 dB range for low-noise environments. The applicant selected 40 dB — the most permissive end — citing precedent at other permitted sites rather than any feature of this site. This choice sits in direct tension with the survey data: the applicant's own instruments were routinely returning derived background values of 17–19 dB, and Table 11-10 records values as low as 17.8 and 18.8 dB. A site at which the instruments cannot reliably measure the background because it is too quiet to record is, by definition, a low-noise environment at the extreme quiet end of the scale, precisely the environment for which the 35 dB option exists. Allegro Acoustics independently makes the same point: Comment 3 notes that, with measured daytime background as low as 23.9 dB, applying the lower 35 dB end of the range would be appropriate, and at its Comment 4 it observes that a fixed 43 dB night-time limit, set against measured night-time background as low as 18.8 dB, would permit operational noise far above the existing environment, and invites the planning authority to consider a lower night-time limit at the quietest locations.

7.3.3 Model Input Parameters at the Permissive End of the Range

The noise model itself was populated with input choices that consistently sit at the lower-precaution end of the available range:

- Ground factor $G=0.5$ rather than $G=0.0$. $G=0.5$ produces lower predicted levels.
- Receiver height of 4 m in the model, which reduces predicted levels relative to the 1.2–1.5 m height at which surveys are actually conducted.
- Roughness length $z=0.05$ m applied for wind-speed standardisation “regardless of what the actual roughness length seen on a site may have been” (the applicant's own words). At a site that is open raised bog published values are typically $z=0.01$ – 0.03 m.

- Atmospheric corrections applied on the basis of downward refraction under temperature inversion — a conservative assumption for standard geometry, but one that does not hold for the receptors that sit above the turbine bases, which at this site and its topographic character are the vast majority of receptors (discussed at length in Chapter 8 Visual Impact and Chapter 9 Shadow Flicker)

Each is defensible in isolation. The pattern is the point.

7.3.4 Cumulative Noise Scoped Out at This Stage

The applicant's own model identifies SIX night-time exceedances of the WEDG 2006 fixed limit at several non-stakeholder properties on a cumulative basis. Table 7.1 below presents them.

Table 7-1 Cumulative Night-Time Exceedances — Ballincor Wind Farm

Receptor	Footnote	Peak Night Excess	Wind Speeds Over Limit	Predicted Night Level (Peak)
Ho60	2	+2.5 dB	7, 8, 9 m/s	45.7 dB
Ho81	4	+2.0 dB	7, 8, 9 m/s	45.2 dB
H100	5	+1.9 dB	7, 8, 9 m/s	45.1 dB
H209	6	+1.4 dB	7, 8, 9 m/s	44.6 dB
H281	7	+1.1 dB	7, 8, 9 m/s	44.3 dB
Ho71	3	+0.8 dB	7, 8, 9 m/s	44.0 dB

Source: Appendix 11.6 — Predicted Noise Levels (Nordex N163 at 105 m hub height)

All six receptors are scoped out under EIAR Chapter 11 §11.6.4.1, on the basis that “the contribution from the proposed project is greater than 10 dB below the turbine noise limit values at these NSLs” (footnote in Appendix 11.6). Effectively they are set aside by invoking the IoA GPG Section 5.1.5 scoping rule. This issue will be addressed in Section 7.4.6.

Summary

Taken together, the choices in this section build headroom at every stage: a high threshold set against an artificially elevated and partly extrapolated background, modelled with input parameters at the permissive end of every range, with cumulative exceedances scoped out. The applicant has pushed every available boundary to the limit in order to demonstrate compliance. The consequence is an assessment with no remaining margin for error, no capacity to absorb any additional noise effect and no room to accommodate the correction of any step that was required but not taken. Section 7-4 sets out the steps that were required but not taken.

7.4. What the Assessment Did Not Do

This section sets out the omissions and unaddressed matters in the assessment. They are ordered by materiality, beginning with the omission of a mandatory methodological step, then the matters affecting the reliability of the underlying survey, then the treatment of cumulative noise, and finally the specific acoustic characteristics and inconsistencies left unaddressed. Where an independent expert corroborates a finding, that corroboration is identified at the relevant point.

7.4.1 The Valley Correction — A Mandatory Step That Was Never Performed

7.4.1.1 *What the correction is and why it was required*

The Institute of Acoustics Good Practice Guide — the methodology the applicant adopted as governing — requires, at Section 4.3.9, that a correction be added to predicted noise levels wherever the ground dips between a turbine and a receptor, forming a concave or “valley” propagation path. Standard noise propagation models, including the ISO 9613-2 model used here, do not capture the additional sound that travels across such a geometry; the Section 4.3.9 correction is the methodology's prescribed remedy for that gap. The Guide is explicit that the correction exists precisely because the standard model is insufficient for concave terrain — so the

correction cannot be treated as already accounted for within the model. The technical trigger is the JOULE geometric formula, which the Guide requires to be evaluated for every turbine and every receptor individually. Where the model uses $G=0.5$ — as this assessment does — the prescribed correction is +3 dB.

7.4.1.2 Why it matters at this site

The Ballincor site is the geometry the correction was written to address: turbines on a flat bog platform, with noise-sensitive receptors on rising ground to the east and west, and lower ground in between. A substantial proportion of the receptors in the NML6 catchment — the location that sets the limits for the most exposed western cluster of properties — sit well above the turbine bases, with the bog platform falling away between source and receiver. This is exactly the concave path that triggers the JOULE formula.

7.4.1.3 The evidence of absence

An exhaustive text search of all nine Ballincor noise documents — Chapter 11 and all eight appendices — returns no occurrence of the correction, the JOULE formula, or any of the defining terms (“valley”, “concave”, “ground profile”, the +3 dB correction, or the Section 4.3.9 reference) anywhere in the noise assessment. This is so despite the Good Practice Guide being cited many times elsewhere in the chapter for other provisions. The step was simply never performed. It is an omission of a mandatory assessment step, not a choice of a permissive limit.

The omission is independently corroborated. Allegro Acoustics, at its Section 3.2.1 and Comment 5, sets out the same Section 4.3.9 requirement, reproduces the JOULE criterion, and asks the applicant to submit further calculation to determine whether the topographical correction applies to the site and, if so, to incorporate it into the predicted levels and reassess the exceedances. A review of other WindFarm applications and their noise surveys shows that consistently this step is taken and this analysis is applied; its absence here is not a matter of universal practice but of a step taken elsewhere and not taken at Ballincor.

7.4.1.4 *The consequence, and where it is quantified*

The correction is not an abstract requirement. When it is applied to the applicant's own predicted noise levels — using the applicant's own turbine coordinates, the applicant's own receptor elevations, the applicant's own night-time criteria, and the ground factor the applicant itself selected — it reverses the compliance position at properties the assessment presented as compliant. The full receptor-by-receptor workings are set out in Appendix 7-3; the result is summarised here.

At eleven non-stakeholder residential properties, the mandatory +3 dB correction produces a confirmed night-time exceedance of the assigned limit: H053 (+1.6 dB), H089 (+1.0 dB), H270 (+0.9 dB), H271 (+1.3 dB), H039 (+0.2 dB), H139 (+0.5 dB), H186 (+1.0 dB), H202 (+1.4 dB), H218 (+0.8 dB), H250 (+1.6 dB) and H312 (+0.9 dB). Each figure is derived from the applicant's own Appendix 11.6 predicted level for that property, with the correction added and the result compared against the applicant's own Appendix 11.5 night-time criterion. Nothing has been introduced from outside the submission. A twelfth property, H093, retains a margin of 0.8 dB after the correction is applied on its own; that margin is consumed once the further matters in Section 7.4.3 are taken into account, and H093 is therefore treated here as a supporting rather than a primary case.

The analysis is deliberately conservative. The JOULE geometry depends on the ground elevation along the propagation path, and a higher assumed bog-floor elevation makes the correction harder to trigger, not easier. The workings in Appendix 7-3 adopt a bog-floor elevation of 50.0 m — at the top of the range of turbine base elevations across the site, and above the bog platform across most of it. To displace the finding, the applicant would have to demonstrate that the actual terrain between source and receiver sits higher than the highest turbine base on the site, which it does not. The eleven exceedances are therefore the minimum the correction produces, not the maximum.

One further property does not appear in the analysis because it does not appear in the applicant's predictions at all. H285 is absent from Appendix 11.6 entirely: it has been given no predicted noise level and no compliance assessment. This is not explicable on acoustic grounds, because H285 is closer to every one of the eleven turbines than H053 — a property the applicant did assess, and presented as compliant only by the

1.4 dB margin that the Section 4.3.9 correction eliminates. A property nearer to every turbine than one already shown to exceed cannot safely be left unassessed. The omission of sensitive locations from the prediction table was independently identified by Allegro Acoustics — the acoustic consultancy instructed by the Greater Birr Wind Action Group — at Comment 6 of its review. The applicant treated H285 as a sensitive receptor for the purposes of its own shadow-flicker assessment (Appendix 16-1) yet omitted it from the noise assessment, and a property the applicant treats as sensitive for one environmental effect cannot be excluded from another without explanation. A second sensitive dwelling, H082, is likewise absent: it meets the applicant's own definition of a noise-sensitive location — a property habitable without requiring planning permission — and is roofed, structurally sound and not derelict. Both are sensitive receptors that should have been assessed and were not. The applicant is required to provide a predicted level for each, apply the Section 4.3.9 correction, and report the result.

The significance of these findings is developed in Section 7.5. For present purposes the point is narrow and, on the applicant's own figures, not open to dispute: a mandatory step in the governing methodology was omitted, and performing it produces confirmed night-time exceedances at eleven homes that the assessment presented as compliant.

Quantification is set out in Appendix 7-3

It is not for the Community to apply this correction, but Appendix 7-3 conducts the receptor-by-receptor, turbine-by-turbine workings, including the conservative bog-floor assumption used throughout. Applying the JOULE formula to the applicant's own turbine coordinates, receptor elevations, predicted levels, night-time criteria and ground factor — introducing no external data — demonstrates that the correction is triggered at multiple receptors, and that applying the mandatory +3 dB correction reverses the compliance position at eleven properties the applicant presented as compliant, producing confirmed night-time exceedances on the applicant's own figures. The eleven are named and quantified at Section 7.4.1.4. The point for the determination is that a mandatory step was omitted, and that the omission is outcome-determinative

rather than cosmetic.

7.4.2 Systematic Instrument Floor Compression

The most consequential survey-reliability finding is that the background measurements were taken largely below the level at which the instruments can measure reliably. An independent regression analysis — digitising the data points from the applicant's own Appendix C scatter graphs and set out in full in Appendix 7-1 to this submission — establishes the following:

Location	Period	Total points	Below 25 dB floor	% unreliable	Points > 7 m/s
NML 1	Night	647	591	91.3%	8
NML 2	Night	760	733	96.4%	31
NML 3	Night	795	686	86.3%	20
NML 4	Night	665	604	90.8%	23
NML 5	Night	393	337	85.8%	10
NML 6	Night	543	482	88.8%	19

At every one of the six night-time monitoring locations, between 85% and 96% of all recorded data points fall below the instrument's 25 dB reliable measurement floor. The vast majority of the survey data is therefore in the zone where the instrument cannot measure accurately. The regression curve fitted to those readings sits higher than the true background, and under the background-plus-5 dB framework that produces a more permissive limit. The applicant's own Table 11-10 corroborates the finding independently: it records derived background values as low as 17.8, 17.9, 18.8 and 18.9 dB — values so far below the 25 dB floor that the readings cannot bear a reliable relationship to the true acoustic environment.

The correct characterisation is precise and defensible: the Rion NL-52 was not an appropriate instrument for the genuinely quiet conditions at these particular sites. This is not an allegation that the instrument was chosen to manipulate the data; it is that the resulting dataset cannot support the background curves and limits derived from it. Appendix 7-1 presents the location-by-location regression charts, the calibration verification for each, and the above-floor regressions that result when the sub-floor data is excluded.

A specific and independently serious defect attaches to that calibration verification. Each calibration certificate in the submission is marked “Page 1 of 2”, yet only page 1 has been provided for every one of the seven instruments. Page 2 is the page that records the actual calibration measurement — the initial and adjusted indicated levels, the calibrator sound pressure level, the environmental conditions, the self-generated noise figure, and the pass or fail outcome of the check. It is absent for all seven instruments. The applicant states that all calibration drifts were within ± 0.2 dB, but page 2 is the document that would demonstrate this, and it has not been submitted. The consequence is that the submission contains no evidence that any of the seven instruments was measuring accurately at the time it was deployed; every derived background level, every noise limit, and every compliance conclusion rests on that unverified calibration.

7.4.2.1 NML6 — the most filtered location shows the weakest fit

NML6 — the monitoring location that sets the limits for the most exposed western cluster of receptors — returns the lowest daytime regression R^2 of all seven locations, at 0.335, meaning wind speed explains only a third of the daytime noise variation there. NML6 is also the location to which the most extensive directional filtering was applied, with five of eight compass sectors removed. If that filtering had successfully removed the Lacka/Skehanagh contribution, NML6's fit should be comparable to or better than the less-filtered locations. Instead it is the worst. Nor is the weakness confined to

NML6. The daytime regression fit is poor at three of the seven locations — $R^2 = 0.328$ at NML7, 0.335 at NML6 and 0.395 at NML2, all read directly from the applicant's own Appendix C scatter graphs. At each, wind speed explains less than 40% of the daytime noise variation. An R^2 below 0.5 in a clean rural dataset points to contamination by an extraneous source, insufficient data, or both. This is a systemic reliability problem across the survey rather than an isolated feature of NML6 — and NML6, the weakest of the three, is the location that sets the limits for the most exposed western receptors.

7.4.2.2 Northerly data excluded at NML5 and NML6 without acoustic basis

At NML5 and NML6, northerly wind-direction data was removed. The stated basis for all directional filtering is the exclusion of Lacka/Skehanagh, which lies to the southwest. No wind farm exists to the north of either location, and no acoustic basis for removing northerly data is stated anywhere in the assessment. The removal of five of eight compass sectors at these locations, including sectors in which no relevant source exists, materially reduces the dataset underlying the regression without explanation.

7.4.3 Modelling Outside the Validated Range

ISO 9613-2 is the propagation method the applicant selected. Every predicted level in Appendix 11.6 is an output of this model, so its limitations are the assessment's own. The general method is validated for receiver/source geometries of low height and distances up to approximately 1,000 m, within which it states an accuracy of about ± 3 dB; a number of receptors here lie beyond that distance, and the 98.5 m hub height sits far above the heights for which the general method was derived. The 2024 edition's Annex D extends the calculation to tall wind-turbine sources, but it does not contain the empirical correction for sound propagating across a concave or "valley" ground profile — which is precisely why the IoA GPG retains §4.3.9 as a separate, mandatory step. The model the applicant chose therefore does not, by itself, capture the dominant terrain effect at this site. The direction of any resulting error is not

neutral: under the stable nocturnal atmospheric conditions characteristic of midland raised bog — the conditions that coincide with the night-time limit period — the established literature on atmospheric stability and wind shear (van den Berg, 2006) indicates enhanced received levels relative to standard daytime-neutral propagation assumptions, i.e. toward under-prediction. The roughness-length choice compounds this. The applicant used $z=0.05$ m for wind-speed standardisation “regardless of what the actual roughness length seen on a site may have been”. Over open raised bog, where published roughness values are $z=0.01$ – 0.03 m, this over-states the wind-speed reduction between hub height and 10 m, with the effect that the turbine operates at a higher point on its sound power curve than the model credits at the 6–7 m/s transition. The result is a systematic, if modest, under-prediction at the wind speeds where compliance is already tight.

7.4.4 The Uncertainty Correction Applied in Two Directions

An internal inconsistency weakens the assessment on its own terms: the uncertainty correction is used in two directions. A +2 dB uplift was applied to source sound power on the stated basis that it makes the predictions conservatively high; measurement uncertainty of ± 2 dB is then invoked at the compliance-check stage to treat near-limit predicted levels as acceptable. Both cannot be true at once. If the source uplift genuinely guarantees conservative predictions, uncertainty at the compliance stage is irrelevant; if uncertainty at the compliance stage is real and material, the source uplift did not guarantee conservatism. The assessment invokes whichever reading supports compliance at each point.

7.4.5 Cumulative Noise — Lived Experience Scoped Out

As Section 7.3.4 noted, the applicant's own model predicts night-time exceedances of the WEDG 2006 fixed limit at six non-stakeholder properties - H060, H071, H081, H100, H209 and H281 — and dismisses all six by invoking the IoA GPG Section 5.1.5 scoping rule, on the basis that Ballincor's contribution is more than 10 dB below

Lacka/Skehanagh's. The technical reading of the rule is correct; the conclusion drawn from it is not, for two principal reasons.

First, the rule is being applied in the wrong direction and at the wrong stage. Section 5.1.5 is a scoping device for determining, at the outset, when a small contributor need *not be modelled* cumulatively. It is being used here at the results stage, *after the fact*, to dismiss exceedances the model has already found. Second, an acoustics scoping rule cannot discharge the planning authority's distinct statutory duty under the EIA Directive and the EPA Guidelines to assess the cumulative receiving environment as it will **actually** be experienced by residents. The planning question is not which source is dominant at H081; it is whether the noise environment that resident will live in is appropriate for permission. A resident who will experience a level above the night-time limit experiences that level regardless of how a model apports it between two wind farms. That another wind farm is the dominant source does not make Ballincor's addition acceptable, it makes the environment to which Ballincor is contributing worse.

7.4.6 Noise Monitoring Locations — NML4 and NML6

Two specific monitoring locations carry defects that go beyond the general compression finding. At NML4, the instrument was relocated by the resident to an undocumented position in an adjacent field between installation and the first battery change, and the applicant recorded that "no significant effect" was observed without any supporting analysis. The IoA GPG required the consultant either to restore the agreed position or to seek an alternative location, to document the position photographically, and to engage with the resident to prevent exactly this; none of that is evidenced. The coordinates and photographs on record represent the original position only, so the dataset for a material portion of the NML4 deployment is from an unverified location. At NML6, the combination of the lowest R^2 of any location with the most aggressive filtering (Section 4.3.1) means the location used to set limits for the most exposed receptors is also the location whose baseline is least reliable. Both require the applicant to demonstrate, by quantitative analysis, that the limits derived from these locations are sound.

7.4.7 Low-Frequency Noise and Amplitude Modulation

The assessment does not adequately address two acoustic characteristics that are specific to large modern turbines and central to lived experience: low-frequency noise and amplitude modulation. The current WEDG 2006 framework contains no explicit treatment of either, which is one of the reasons the revised Guidelines (Section 7.2.7) introduce penalties of up to 11 dB for them. That gap in the governing standard is not a reason to leave the matter unassessed; it is a reason to address it by condition.

The assessment acknowledges amplitude modulation but defers any response to a post-commissioning complaints protocol on the basis that the excessive form cannot be reliably predicted at planning stage. That the precise occurrence cannot be predicted is not disputed; what does not follow is that no planning condition is warranted where every precondition is present. There is established precedent within County Offaly for a condition prohibiting tonal and impulsive noise. A further difficulty is that the LA₉₀ 10-minute metric on which compliance would be checked is, by its nature, insensitive to short-duration impulsive events — the very “thump” events residents would complain about — so a compliance regime resting on that metric alone offers limited protection. On low-frequency noise, no assessment against an established low-frequency criterion is provided. Both should be the subject of explicit planning conditions.

Each of those preconditions is present here, on the applicant's own data. The EPA Guidance Note NG3 identifies the conditions under which excessive amplitude modulation arises: close turbine spacing, a tower-height-to-rotor-diameter ratio below approximately 0.75, stable atmospheric conditions, and topography that presents the blades with different wind directions through a single rotation. The Nordex N163 has a tower-to-rotor ratio of 0.60, below the 0.75 threshold. The site is a midland raised bog, where the stable nocturnal inversions already discussed are a documented feature of still nights. And the layout is exceptionally tight: calculated from the turbine coordinates in Appendix 16-1, the shortest inter-turbine distance is 455 m, only 2.79 times the 163 m rotor diameter, against a recommended minimum abreast spacing of

five rotor diameters; five turbine pairs fall below 520 m. There is established precedent within County Offaly for such a condition: the Cloghan Wind Farm carries a planning condition specifying that noise shall not exceed 43 dB LA90 and that there shall be no tonal or impulsive noise — a condition prohibiting precisely the characteristics the LA90 metric alone cannot capture. A condition of that kind is the appropriate response here.

7.4.8 Mitigation and Monitoring Adequacy

The mitigation and monitoring package does not match the scale of what is at stake. The curtailment strategy proposed for the nearest receptor is described as an outline requiring verification by the turbine manufacturer, and that verification has not been obtained — the authority is asked to accept an unverified outline as mitigation for the closest home to the development. No Noise Compliance Monitoring Programme has been submitted; in its place is a draft protocol for managing complaints, which is a reactive, self-administered mechanism that places the burden of detecting non-compliance on the residents being affected and provides no independent oversight, no pre-agreed measurement methodology, no reporting to the planning authority, and no enforceable response timeline. For a development of this scale and proximity, a full, independently administered monitoring programme, approved before construction, is the appropriate standard, and should be required by condition.

7.4.9 Offaly County Development Plan — DMS-109 and WHO 2018 Consistency Not Demonstrated

A substantial part of the scheme — including turbines, noise-sensitive receptors and associated infrastructure lies within the administrative area of Offaly County Council. The Offaly County Development Plan therefore applies to the Offaly portion of the development as the statutory land-use framework against which the application falls to be assessed.

The Offaly County Development Plan, at Development Management Standard DMS-109, requires that wind energy development demonstrate consistency with the WHO Environmental Noise Guidelines for the European Region (2018) as part of the noise assessment. This is not optional or advisory guidance that an applicant may weigh and set aside according to its own preference: it is an adopted development-plan standard, carrying the statutory weight that attaches to the development plan under the Planning and Development Acts. Where a development plan sets a noise standard, the question for the assessment is whether the development is consistent with it — not whether the applicant's acoustic consultants agree it is the right standard.

The applicant's assessment does not demonstrate that consistency. Chapter 11 (§11.3.2.6.g) addresses WHO 2018 at some length, but does so almost entirely in order to argue against applying it. It characterises the WHO Lden parameter as "a poor characterisation of wind turbine noise," notes that the 45 dB Lden recommendation is "conditional" and supported by evidence the WHO itself rates as "low," and concludes that the WHO-recommended 45 dB Lden exposure level "is not an appropriate target noise criterion for an existing or proposed wind turbine development in Ireland." Having reached that conclusion, the assessment does not calculate Lden at any noise-sensitive location, and presents no comparison of predicted Lden levels against the 45 dB WHO threshold anywhere in the chapter or its appendices. The chapter makes no reference to Offaly CDP DMS-109 at all.

Two points follow. First, the merits of the applicant's critique of Lden are beside the point for this application. An applicant is free to argue, it is not free to decline to assess against that standard because it disagrees with it. DMS-109 requires a demonstration of consistency with WHO 2018, and the proper response to that requirement is to perform the assessment, not to explain why it should not be required. Second, the absence of any Lden assessment means that, on the documents submitted, An Coimisiún Pleanála simply cannot determine whether the development is consistent with the Offaly County Development Plan on noise grounds. A material question of development-plan compliance has been left unanswered.

The applicant must provide Lden calculations for all noise-sensitive locations within the Offaly planning area, compare them against the WHO 2018 thresholds, and demonstrate consistency with Offaly CDP DMS-109, before the application can properly be determined.

7.5 Conclusion

This is the chapter on which the Inspector's decision bears most directly on the lived environment of the people who will experience this development. The courts have made clear that it must be resolved properly here, at the determination stage, not left to be fought house by house once the turbines are running. Measured against the standards the applicant itself adopted as governing, the assessment is not adequate for that purpose.

At every stage where the methodology permitted a choice, the more permissive option was taken, with the result that the assessment operates at the outer edge of what the standards allow and retains no margin for error. Against that background, the assessment omits entirely a mandatory correction step required by its own governing methodology; rests on a background survey the great majority of whose data falls below the level at which the instruments can measure reliably; applies its propagation model outside that model's validated range; scopes out cumulative exceedances its own model predicts; and leaves amplitude modulation, low-frequency noise, monitoring, and mitigation inadequately addressed. The assessment does not demonstrate the consistency with the WHO 2018 Guidelines that the Offaly County Development Plan requires at DMS-109, and produces no Lden assessment at all.

A number of these findings are independently corroborated by Allegro Acoustics, an acoustics expert consultant reaching the same conclusions from its own analysis (see Appendix 7-1).

None of the findings in this submission is introduced from outside the applicant's own documents. They are what the assessment shows when the applicant's own methodology is applied in full and read consistently. On that evidence, it cannot be established that the predicted levels are correct for the topography of the receiving environment, that the limits derived are reliable, or that the development is consistent with the statutory development plan on noise grounds.

Given the direction of Irish noise policy, the imminence of a materially stricter national standard, and the clear signal from the courts that questions of noise nuisance should be resolved at the planning stage, the appropriate course is not incremental

amendment but refusal. For the reasons set out in this submission, the Greater Birr Wind Action Group respectfully requests that An Coimisiún Pleanála refuse permission for the proposed development on noise grounds

APPENDIX 2: Shadow Flicker

Chapter 9: Shadow Flicker

Appendix 9-1:	Gurteen Vs Birr Sunshine Data
Appendix 9-2:	Technical Appendix
Appendix 9-3:	Unassessed Sensitive Receptors
Appendix 9-4:	Receptor Elevation Geometry

9.0 Introduction

This chapter addresses Chapter 16 EIAR and the three WindPRO modelling appendices submitted with it. It interrogates the applicant's own documents and demonstrates from those documents alone that the shadow flicker assessment placed before An Coimisiún Pleanála cannot support a grant of planning permission. Appendices 9-1 to 9-4 have been compiled to support the assertions and dataset conclusions drawn in this chapter.

This review will present five evidence-based grounds of objection, each supported by the applicant's own submitted documents. The grounds compound each other in a way that is more than the sum of their parts.

9.1 Summary of Grounds

- **Ground 1 — The Compliance Case Rests on the Wrong Baseline Weather Data.** Every "Expected" compliance figure in Chapter 16 is produced by multiplying the worst-case modelled hours by a single sunshine probability fraction, and that fraction is wrong. The applicant's worst-case figures show 41 receptors above the 30-hour annual threshold and 46 above the 30-minute daily threshold; every one of those exceedances disappears only after the sunshine reduction is applied. The EIAR text attributes the fraction to the Mullingar station (83 km away), records from 1979-2006, while the model actually ran Birr data 1981-2010. The two are in direct conflict, and no reader can reconstruct the Expected values from the EIAR's own stated source. That said, neither station is appropriate. Gurteen, 4.5 km from the site, has recorded radiation continuously since 2008 and shows **27.5% more annual sunshine** than the Birr data the model used. Corrected for Gurteen, the margin of compliance narrows at every receptor. If the foundation fails, every conclusion built on it fails with it.
- **Ground 2 — The Derivation of the Compliance Figures Has Never Been Disclosed.** Distinct from the choice of dataset is the question of method. The Expected values are produced by combining the sunshine fraction with the wind-direction fraction and the worst-case results/ Nowhere in the submitted documents is it explained how that combination is performed. No formula is given and no worked example is shown. The calculation is not a simple multiplication, the model weights sunshine probability against wind direction because a turbine casts shadow only when it is moving. That interaction determines every compliance figure in Table 16-1. An inspector cannot verify from the

submitted documents how any Expected figure was arrived at. The entire compliance case rests on figures whose derivation has not been disclosed.

- Ground 3 — The Site Geometry Is Inverted From the Standard Model.** The conventional shadow flicker model assumes turbines on elevated ground and homes below, with shadows cast downward and broken up by terrain. At Ballincor the turbines sit on bog at 43–63 m above sea level and, established from the applicant's own Digital Terrain Model elevations, 65 of the 129 assessed homes sit above the blade bottom of their nearest turbine, 49 of those are above the blade bottom of every turbine in range. Residents look across at, or up into, the lower rotor arc rather than up at an overhead machine. The pattern is concentrated and severe across the southern arc (38 of 39 properties), the eastern arc (67%) and the western arc (64%). This single geometric fact corrupts a further element of the assessment, addressed in Ground 4: it invalidates the study boundary. It also transforms the character of the shadow events themselves, which now arrive at the lowest sun angles in their longest, most horizontal and most penetrating form.
- Ground 4 — The Study Boundary Is Too Small and Excludes Properties the Applicant's Own Software Reached.** The applicant drew a study boundary at 1,630 metres (ten rotor diameters of the N163) and reported no results beyond it yet the applicant's own software was set to calculate shadow to 1,789 m (N163), 1,823 m (N149) and 1,905 m (V150). 56 sensitive properties identified by the applicant sit in that gap, between 1,630 m and 1,905 m, and none was assessed or explained. Two further properties, R258 and R288, sit at exactly 1,630 metres — on the line the applicant drew — and were excluded without explanation. Receptor 217 is plotted on the applicant's own Figure 16-1 shadow flicker map but never entered into the receptor list or modelled. Taken together, 58 sensitive properties the applicant itself identified were never assessed. The 1,630 m rule is in any event derived from flat-terrain assumptions that do not hold here: at the model's own 3-degree minimum, the shadow from a 180 m tip is still 95 m above ground when it crosses the boundary. The 1630m radius marks a point well within the shadow, not its edge.
- Ground 5 — Shadow-Day Data the Applicant Held Was Not Disclosed, and the Impact Is Understated.** WindPRO produces two “days” figures per property: the total number of days on which any shadow flicker occurs, and the number on which it exceeds 30 minutes. Chapter 16 reports only the second; the total shadow-days column the applicant's own software produced appears nowhere in the chapter. The effect is twofold. Properties that do exceed the daily threshold appear to have far fewer affected days than they do — Receptor 160 shows 86 days in Table 16-1 against 212 in the appendix; Receptor 261 shows

65 against 185. And 34 properties whose daily maximum is below 30 minutes show zero days in Table 16-1 and appear completely unaffected, when the appendix records between 25 and 147 days of shadow flicker at each of them. A planning authority reading Chapter 16 in good faith would form a materially different understanding of the scale of impact than the applicant's own data supports.

- **Ground 6 — Compound Multi-Turbine Shadow Flicker Is Never Assessed.** The assessment sums shadow flicker from all turbines into a single annual total per property and so misses compound flicker entirely, that is the case where two or more turbines cast shadow through the same window at the same time. Using the applicant's own coordinates and study boundary, 44 of the 129 assessed properties lie within the simultaneous shadow zone of two or more turbines; 19 are Critical (turbine pairs within 10 degrees of bearing, producing overlap windows of 4–39 minutes every suitable day) and 18 are Severe (10–20 degrees, 43–76 minutes). Not one of the 44 has been assessed for compound exposure. This is not a larger version of single-turbine flicker: blade shadows arriving alternately from two machines at close to double frequency produce the irregular, arrhythmic, high-contrast stimulus that the peer-reviewed photosensitivity research identifies as most potent. The 30-minute threshold has no category for it.
- **Ground 7 — The Cumulative Assessment Overlooks Two Operational Wind Farms.** Chapter 16, Section 16.2.5 states there is "no potential for overlap of the same receptor with any other proposed or operational wind farm developments." The applicant's own Chapter 4, Table 4-2 lists two operational wind farms immediately west of the site: Lacka at approximately 1.7 km and Skehanagh at approximately 2.7 km, eight turbines in total. The nearer lies within the 2 km cumulative-assessment threshold set by the IWEA Best Practice Guidelines the applicant itself cites. A coordinate check identifies 32 sensitive properties falling within the combined shadow zones; because the Ballincor turbines cast westward in the morning and the existing cluster casts eastward in the afternoon, properties between them can receive shadow from opposing directions on the same day. The statement at 16.2.5 was not a considered finding but an unexamined assumption presented as fact, and it is contradicted by the applicant's own Chapter 4.
- **Ground 8 — No Expected Daily Maximum, and Thresholds With No Medical Basis.** Two related deficiencies in the standard applied. First, although the applicant claims expected annual compliance, it has never calculated or disclosed an Expected daily maximum for the 30-minute-per-day limit: for 46 properties the worst-case daily maximum exceeds 30 minutes, and the figure that would show whether realistic conditions bring them within the

daily limit is simply absent. Second, the 30-hour/year and 30-minute/day thresholds themselves have no medical basis — they are legacy administrative limits from 1990s German planning practice for turbines of 50–80 metres, roughly a third of the height proposed here. Voicescu et al. (2016) found the daily maximum a better predictor of annoyance than the annual total, and found people with migraine, dizziness or tinnitus at three times higher odds of annoyance; Ireland's primary metric remains annual hours.

- **Ground 9 — The Mitigation Cannot Cure the Defect.** The applicant's answer to every failure above is the same: an automatic shutdown system will prevent non-compliance. It cannot. The system is calibrated to the 30/30 thresholds, not to zero, so it permits up to 29 minutes of flicker daily until the annual cap is reached; it can respond only to what the model recorded, so it cannot reach the 58 unassessed properties or the sub-threshold and compound exposures the model never measured; it will be operated and self-reported by the developer, with no independent monitoring, no named enforcement body and no resident-accessible review. The applicant's "near zero" commitment is used in three irreconcilable senses in the same chapter and is breached on the applicant's own Expected values within the first year. The Cloghan precedent demonstrates what this enforcement architecture produces in practice, and the CJEU has held (C-50/09; C-427/07) that deficiencies in environmental assessment cannot be cured by post-permission monitoring. This is a transfer of risk from the developer to the residents, and it is not a lawful planning basis.

9.2 The foundation of the compliance case is unsound

Every compliance figure in Chapter 16 is the product of a single arithmetic step: the worst-case modelled hours are multiplied by a sunshine probability fraction. If that fraction is wrong, every Expected value is wrong, and the entire finding of zero non-compliant receptors falls with it. This section will establish a foundational point that affects every result, every table, and every compliance claim in Chapter 16.

In this submission the "Expected (Realistic)" values are built on sunshine probability data that is internally inconsistent, misattributed in the EIAR text, drawn from the wrong station, and contradicted by an up-to-date and current 18-year dataset from a Met Éireann station 4.5 kilometres from the site that the applicant never used, cited, or acknowledged.

This is not a peripheral technical dispute. The Board is asked to understand at the outset that if the baseline weather data is wrong, everything derived from it is wrong. The worst-case modelled figures show 41 receptors exceeding the 30 hours per year threshold and 46 exceeding the 30-minutes-per-day limit. It is only after the sunshine probability reduction is applied that every one of those exceedances disappears and the assessment returns a finding of zero non-compliant receptors. That reduction is the single most consequential number in the entire chapter. It is the number that converts a failing assessment into a passing one..

9.2.1 What the Compliance Case Requires

The WindPRO shadow modelling software produces two sets of outputs for each receptor: a *Worst-case* figure, which assumes 100% sunshine during all daylight hours and worst-case wind alignment for the entire year, and an *Expected (Realistic)* figure, which applies two reduction factors to the worst case, one for the probability that the sun is actually shining on any given day (the sunshine fraction), and one for the probability that the wind is aligned to cast the maximum shadow (the wind direction

fraction). The Expected values are computed by multiplying the worst-case figure by these two fractions.

The sunshine fraction is therefore not an incidental input. It is a direct multiplier on the worst-case hours. If the sunshine fraction is understated, that is, if the station used records less sunshine than the site actually receives, then the Expected values are correspondingly understated, they inevitably show less shadow flicker than will realistically occur. In this case the margin between the reported Expected hours and the 30-hour compliance threshold is artificially widened, not because the site is less affected than the worst case, but because the baseline sunshine figure is lower than the site actually experiences. This is the error this submission relies upon throughout.

9.2.2 What Dataset the EIAR Claims to Use– Mullingar Data 1979-2008

Chapter 16, page 16-12, makes the following statement:

"Met Éireann data for this region shows that the sun shines on average for only 30% of the daylight hours per year."

Footnote 6 in that chapter identifies the source of this figure as the **Mullingar 1979–2008** averages published on the Met Éireann website, accessed March 2025. The Mullingar meteorological station is located in Co. Westmeath at Latitude 53.54°N, Longitude -7.36°E — 83 kilometres north-northeast of the Ballincor site.

9.2.3 What Dataset the Model Actually Used – Birr Data 1981-2010

The WindPRO output reports — Appendices 16.1, 16.2, and 16.3, covering all three turbine scenarios — each carry the following header on the first page, identical in all three cases:

Sunshine probability S (Average daily sunshine hours)* ***[BIRR] Jan 1.57 — Feb 2.08 — Mar 2.82 — Apr 4.36 — May 5.20 — Jun 4.37 — Jul 4.15 — Aug 3.90 — Sep 3.54 — Oct 2.68 — Nov 1.94 — Dec 1.23***

These twelve monthly values match exactly — to two decimal places in every month — the published Met Éireann climatological normals for **Birr, Co. Offaly, 1981–2010**. The Birr station page is separately cited in footnote 2 of the same chapter, in relation to wind direction data. The model did not use Mullingar data. It used Birr data. The EIAR text and the model inputs are in direct and irreconcilable conflict. The Mullingar sunshine record cited in footnote 6 moreover ends in December 2006 — the “1979–2008” period is a mischaracterisation; the data runs to 2006 at most, leaving the cited dataset at minimum 20 years out of date at the time the model was run.

The two datasets produce sunshine fractions 14.3% apart: Mullingar at 32.9% (rounded to “30%” in the EIAR text) versus the lower Birr figure (what the model actually ran). Because the EIAR invokes the Mullingar percentage to justify the reduction while the model applied the Birr figure, no independent reader can reconstruct the Expected values from the EIAR's own stated source.

9.2.4 What Dataset the Model Should have Used – Gurteen Data 2008-2025

Neither Birr nor Mullingar is the nearest available Met Éireann station to the Ballincor site. That station is **Gurteen, Co. Tipperary**, at Latitude 53.04°N, Longitude -8.01°E, **4.5 kilometres west** of the site.

Gurteen has recorded daily global radiation continuously since February 2008. The Met Éireann data file contains 6,081 daily radiation observations spanning February 2008 to March 2026. This represents 18 years of contemporary, proximate measurement from a station climatologically representative of the Ballincor area, subject to the same Atlantic weather systems, at the same latitude, and at essentially the same elevation.

The World Meteorological Organisation standard for climatological normals requires a minimum of 10 years of data before a station can be used as a reliable long-term average input. Gurteen, at 18 years, comfortably exceeds that threshold. Its record

spans dull years (2012: estimated 1,212 sunshine hours — one of the lowest on record) and exceptionally sunny years (2022: estimated 1,718 sunshine hours), capturing the full range of inter-annual variability that determines realistic shadow flicker probability at this location.

Global radiation is converted to estimated sunshine hours using the Ångström-Prescott formula, the standard method used by Met Éireann, by the FAO-56 reference evapotranspiration methodology, and by meteorological agencies internationally. The conversion is well-validated for Irish conditions and produces monthly sunshine hour estimates directly comparable in format to the Birr data used in the model. Applying this method to 17 complete years of Gurteen data (2009–2025) available to view in Appendix 9-1, yields the following:

Gurteen shows **27.5% more annual sunshine** than the Birr data entered into the model (full workings at Appendix 9-1: Gurteen Sunshine Fraction - An Independent Verification).

Because the relationship between sunshine fraction and Expected shadow hours is directly linear in WindPRO, applying Gurteen data would increase the Expected values at every receptor by approximately the same proportion. Table 9-1 below shows the adjusted figures for the highest-exposure receptors.

Table 9-1 Expected Values (Birr Data) Vs Corrected/Expected Values (Gurteen Data)

Receptor	Worst case annual	Expected — as submitted (Birr data)	Gurteen-corrected Expected ($\times 1.275$)	Headroom vs 30h limit
160	99h 59min	15h 50min	20h 11min	9h 48min

Receptor	Worst case annual	Expected — as submitted (Birr data)	Gurteen-corrected Expected (*1.275)	Headroom vs 30h limit
17	83h 56min	13h 18min	16h 57min	13h 02min
285	80h 45min	14h 26min	18h 24min	11h 35min
296	77h 21min	13h 49min	17h 36min	12h 23min
261	75h 40min	12h 07min	15h 26min	14h 33min

Expected figures sourced directly from WindPRO Appendix 16-1. Gurteen-corrected figures apply a factor of 1.275, reflecting the 27.5% additional annual sunshine recorded at Gurteen versus the Birr data used in the model (full derivation at Appendix 9-1). The corrected figures are a floor, not a ceiling — they address the sunshine station error only.

On the annual hours threshold alone, no receptor crosses 30 hours under the Gurteen correction but that correction addresses only the sunshine station error. The Board is asked to treat the Gurteen-corrected figures as a floor, not a ceiling: they correct the sunshine input alone, while other directional issues identified in the grounds below, the cumulative shadow flicker from Lacka and Skehanagh that was never modelled, remain unquantified. The submission does not assert that these push any receptor over 30 hours; it asserts that the corrected figures cannot be treated as a ceiling while those issues remain unaddressed.

9.2.5 The consequence of the sunshine correction values

Two immediate consequences of the sunshine correction itself follow, and both are calculated, not projected.

1. The margins of compliance narrow substantially even at the most-exposed occupied receptors: Receptor 17, the highest-exposure occupied property in Table 9-1, moves from an Expected figure of 13 hours 18 minutes to a Gurteen-corrected figure of 16

hours 57 minutes ($13:18 \times 1.275$) — a real increase of 3 hours 39 minutes on this one receptor from the sunshine station error alone, before any of the other unquantified factors are considered.

2. The number of days per year on which each receptor experiences any shadow flicker — data the applicant's own software produced but omitted entirely from Table 16-1 — increases proportionally, with direct implications for the daily 30-minute threshold.

9.2.6 Consequence for All Subsequent Grounds

Because the Expected values underpin the applicant's claim of zero exceedances, and because those values are built on baseline weather data that is misattributed, internally inconsistent, and materially lower than the best available local source, every conclusion in Chapter 16 that relies on the Expected figures is called into question. The grounds that follow address additional and independent defects in the modelling methodology. The Board is asked to bear in mind throughout that even if each of those further grounds were resolved in the applicant's favour, the Expected values presented in Table 16-1 would still not be verifiable or reliable until the model is rerun with a disclosed, consistent, site-representative, and contemporary sunshine dataset.

9.2.7 The derivation methodology was never disclosed

A further and distinct problem with the Expected figures concerns how they were produced. The applicant's appendix sets out two datasets: a monthly sunshine hours table and an operational hours by wind direction table. The Expected values are derived by combining these two factors with the worst-case results. But nowhere in the submitted documents is it explained how this combination is done. No formula is given. No worked example is shown.

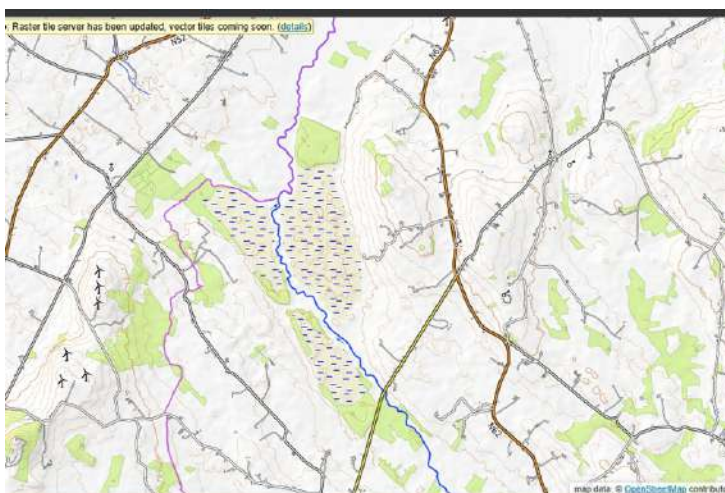
The calculation is not as simple as multiplying worst-case figures by a sunshine fraction. The model weights sunshine probability differently depending on the wind direction, because a turbine only casts shadow when it is actually running. That interaction is at the heart of the Expected value calculation. It determines every

compliance figure in Table 16-1. And it has never been explained. An inspector cannot verify from the submitted documents how any Expected figure was arrived at. The entire compliance case rests on figures whose derivation has not been disclosed.

Section 9-2 has shown that the assessment fails at its foundation. The baseline weather data is wrong, the methodology underpinning every compliance figure has never been disclosed, and the consequential errors all run in one direction.

9.3 The Site Topography – Why this site is different

The standard shadow flicker model assumes turbines sit on high ground and homes sit below them. Shadows are cast downward and across the landscape. Terrain and hedgerows break up the shadow before it reaches anyone's window. At Ballincor the situation is different. The turbines sit on bog at between 43 and 63 metres above sea level. Many of the surrounding homes sit on ground that is significantly higher. This means residents are not looking up at a turbine that is above them. They are looking across at a turbine whose rotor arc begins at or below their eye level. This is a fact the applicant's assessment consistently fails to account for.



At the 3-degree solar elevation the model uses as its minimum threshold, the shadow from a 180-metre turbine tip is still travelling through the air at approximately 95 metres above the ground when it reaches the 1,630 metre study boundary. It has not come close to landing. The study boundary does not mark the edge of the shadow. It marks a point well within it.

Shadow flicker models are calibrated for the standard situation: turbines above, homes below. They assume shadows travel downward and across the landscape, losing intensity and being broken up by terrain along the way. Every built-in assumption in the model reflects that standard geometry.

When a home is higher than the turbine base, all of those assumptions break down. Shadows don't travel down to the property — they arrive nearly horizontally. The lower part of the rotor arc appears at or below the horizon from the property.

9.3.1 The Evidence from the Applicant's Own Documents

The applicant's WindPRO Appendix 16-1 records the ground elevation of each assessed property. These elevations come from the applicant's own Digital Terrain Model. The turbine base elevations are also in the appendix. Using those two figures, and the blade bottom clearance of 17 metres confirmed in the EIAR, we can calculate whether each property sits above or below the lowest point of the rotor arc.

The result, using only the applicant's own data, is as follows. The blade bottom of each turbine ranges from 59.5 metres above sea level (T03, the lowest base on the site) to 79.4 metres above sea level (T06, the highest base). A property whose eye level is above those figures is sitting within the lower rotor arc.

Receptor 249, which the applicant's own appendix records at 83.1 metres above sea level, is one example. Its nearest turbine, T08, has a blade bottom at 65.9 metres above sea level. The observer at Receptor 249 is looking at these turbines at rotor level rather than upward at them from below. This produces a very different shadow flicker event as there is no dilution of the shadow and absolutely no possibility of screening.

9.3.2 How Widespread This Problem Is — A Systematic Analysis

Receptor 249 is not an isolated case. Using the applicant's own elevation data from Appendix 16-1, we applied the same calculation to all 129 assessed properties. See Appendix 9-4. The results are striking.

- 65 of the 129 assessed properties have their observer eye level above the blade bottom of their nearest turbine. This is based entirely on the applicant's own ground elevation figures (column Z in Appendix 16-1), the applicant's own turbine base elevations, and the applicant's own blade bottom clearance of 17 metres.

- Of those 65 properties, 49 have their eye level above the blade bottom of every turbine within the calculation distance — not just the nearest one.

Table 9-2: Summary of Elevation statistics

Direction from site	Properties assessed	Eye above blade bottom	%	Ground range (m above sea level)
North	19	3	16%	45–64m
North-East	3	1	33%	49–83m
East	6	4	67%	49–82m
South-East	14	7	50%	52–73m
South	39	38	97%	64–90m
South-West	11	2	18%	70–77m
West	14	9	64%	55–73m
North-West	23	1	4%	47–60m

The pattern is not uniform. The north and north-west of the site is genuinely low, bog-level ground — only 1 of 23 north-western properties is above the blade bottom. We are not claiming the problem is everywhere. But the southern arc is dramatic: 38 of 39 southern properties sit above the blade bottom of their nearest turbine. The eastern arc and western arc show 67% and 64% respectively. This is not an occasional quirk — it is the dominant condition across three sides of the assessment area.

The south-west appears to be an exception — only 2 of 11 properties are above the blade bottom — but this is because T06, the nearest turbine for most south-western properties, has the highest base on the site at 62.4 metres. Its blade bottom sits at 79.4 metres, which is above most south-western eye levels. This is an honest qualification and we include it.

For properties at higher elevation than the turbine bases, shadow flicker arrives when the sun is low in the sky — producing the longest, most horizontal and most penetrating shadows, and the most intense flicker. The assessment reports these events only as an annual hours total, which conveys nothing of their intensity. How this affects specific households is shown in the Case Studies section of this submission.

How this affects specific households is shown in the Case Studies section (Section 9.8 at the end of this chapter)

9.4 Boundary Adequacy: Properties excluded or missing from the study

The applicant used a study boundary of 1,630 metres, described as 10 times the rotor diameter of the N163. Appendix 9-3 examines in full the distance from all receptors to their nearest turbine.

9.4.1 Missing: Receptors 258 and 288

Two sensitive receptors — R258 and R288 — sit at precisely 1,630 metres from their nearest turbine. R258 is 1,630 metres from T3; R288 is 1,630 metres from T8. Both distances are calculated by Haversine formula from the ITM coordinates in the applicant's own Appendix 5-1 and Appendix 16-1. Neither property appears in Table 16-1. Neither was modelled. The EIAR provides no explanation for their exclusion.. These are not properties beyond the boundary. They are properties at the boundary — exactly on the line the applicant drew. If the stated rule is that all sensitive receptors within 1,630 metres are assessed, then R258 and R288 are within 1,630 metres and should have been assessed. Their exclusion is unexplained and cannot be reconciled with the applicant's own stated methodology. Only ONE of these properties is the home of a party to this submission.

9.4.2 Missing: Receptor 217 — never modelled

Receptor 217 appears on the applicant's own Figure 16-1, the shadow flicker map submitted as part of this application, showing all identified sensitive receptors plotted

against the shadow flicker contours. Receptor 217 is clearly visible on that map. It does not appear in Table 16-1, does not appear in the WindPRO receptor input list, and was never modelled. A property the applicant identified and plotted on their own shadow flicker map was excluded from the assessment without explanation. This is a deficiency in the assessment that has not been acknowledged or corrected anywhere in Chapter 16.

9.4.3 The Study area is too small – 56 properties were never assessed

The applicant used a study boundary of 1,630 metres, properties beyond that boundary were excluded from the assessment entirely. Two major issues become clear:

1. The boundary is based on flat-terrain assumptions

The 1,630 metre boundary was developed for flat, open sites where shadow intensity drops off predictably with distance. At Ballincor, shadows travel nearly horizontally to elevated properties, carrying further with less loss of intensity. The 1,630 metre rule was never designed to account for this. At 3 degrees solar elevation, the model's own minimum threshold, the shadow from a 180-metre turbine tip is still travelling through the air at approximately 95 metres above the ground when it reaches the stated study boundary. The study boundary does not mark the edge of the shadow. It marks a point well within it.

2. The applicant's own software used a larger boundary

A comparison of the three WindPRO appendices shows that in every scenario, the model's calculation envelope extended beyond the 1,630 metre boundary stated in the EIAR.

Table 9-3: Calculation distance versus stated study boundary

Scenario	Calculation distance	Gap beyond 1,630 m	Properties beyond 1,630 m (cumulative)

Scenario	Calculation distance	Gap beyond 1,630 m	Properties beyond 1,630 m (cumulative)
N163 (worst case)	1,789 m	+159 m	36
N149	1,823 m	+193 m	42
V150	1,905 m	+275 m	56

56 sensitive properties identified by the applicant sit between 1,630 metres and 1,905 metres — each one listed in Appendix 9-3. All of them were excluded from the assessment. None of them appears in Table 16-1. The applicant's own software was set to calculate shadow to 1,905 metres for the V150 scenario. The applicant then drew the boundary at 1,630 metres and reported no results — and no explanation — for the 56 sensitive properties the software had already reached..

Taking the three categories together, the 56 properties beyond the stated boundary that the model itself calculated shadow for, the two properties (R258 and R288) at the boundary excluded without explanation, and Receptor 217 plotted on the applicant's own map but never entered into the receptor list, 58 sensitive properties identified by the applicant were never assessed. The elevated receptor geometry and the compound multi-turbine exposure identified mean that actual flicker exposure at the most affected properties is greater in frequency, duration, and severity than the applicant has assessed.

9.5 The Impact is Understated – 4 Critical Omissions

Section 9.2 showed that the foundation of the assessment is unsound. Sections 9.3 and 9.4 showed that the geometry and the boundary do not fit this site. All of those issues compound the effect and undermine the reliability and credibility of the Applicant's shadow flicker report at its foundation. This section turns from how the assessment was constructed to what it actually reports and more tellingly to what, on the applicant's own data, it does not report at all. This section addresses four critical omissions that, taken together, materially understate the impact this development will have on the people who live next to it. Each is established from the applicant's own documents.

9.5.1. Shadow-day data the applicant held and did not disclose

A cross-examination of WindPRO Appendix 16-1 against Chapter 16 Table 16-1 confirms that the figures in the chapter are consistent with the Appendix, no transcription errors were found. However, this cross-examination has identified a material omission that gives a fundamentally misleading picture of the scale of impact.

The WindPRO software produces two different 'days' figures for each property. The first is the number of days per year on which any shadow flicker occurs at all. The second is the number of days on which shadow flicker exceeds 30 minutes. Chapter 16 Table 16-1 reports only the second of these.

The first, the total shadow days figure, does not appear anywhere in Chapter 16. This omission creates two categories of misrepresentation:

1. Properties that do exceed the 30-minute threshold appear to have fewer affected days than they actually do.

2. 34 properties whose maximum daily duration is below 30 minutes show zero days in Table 16-1. They appear completely unaffected — when the appendix records between 25 and 147 days of shadow flicker at each of them.

Table 9-4 below captures the data for properties that do exceed the 30-minute threshold but appear to have fewer affected days than they actually do.

Table 9-4: The most significantly affected properties: shadow days omitted from Chapter 16

Receptor	Worst case annual	Total shadow days (appendix)	Days >30 min (Table 16-1)	Days not in chapter
160	99h 59min	212	86	126
285	80h 45min	146	94	52
296	77h 21min	109	90	19
261	75h 40min	185	65	120
17	83h 56min	182	85	97
73	50h 24min	164	29	135

Receptor 160, which carries the model's highest single figure (99 hours 59 minutes worst-case annual, 212 shadow days), is also present in the applicant's own appendix; Table 16-1 records 86 days for that property, with the remaining 126 days not appearing anywhere in Chapter 16.

Receptor 261, an occupied home experiencing shadow flicker on 185 days per year according to the appendix, illustrates the scale of omission: For this receptor Table 16-1 records 65 days only, leaving 120 days on which shadow flicker occurs but lasts less than 30 minutes entirely absent from Chapter 16.

Table 9-5 below is a representative sample of the 34 properties whose maximum daily duration is below 30 minutes and show zero days in Table 16-1.

Table 9-5: Properties that appear unaffected in Table 16-1

Receptor	Total shadow days	Max daily	Table 16-1 shows	Worst case annual
270	142 days	27 min	0 days — appears unaffected	34h 01min
218	131 days	21 min	0 days — appears unaffected	25h 57min
89	129 days	24 min	0 days — appears unaffected	29h 14min
280	120 days	28 min	0 days — appears unaffected	33h 15min
39	119 days	25 min	0 days — appears unaffected	21h 25min
297	106 days	27 min	0 days — appears unaffected	23h 57min

They appear completely unaffected when the Appendix records between 25 and 147 days of shadow flicker at each of them.

A planning authority reading Chapter 16 in good faith would form a materially different understanding of the extent of shadow flicker impact than the applicant's own data supports. 34 properties appear unaffected. They are not.

9.5.2 Compound shadow flicker — two turbines at once

The applicant's shadow flicker assessment adds up shadow flicker from all turbines into a single annual total for each property. This approach misses a distinct and more serious category of impact entirely: compound shadow flicker, where two or more turbines are simultaneously casting shadow through the same window at the same time.

When two turbines lie close together in bearing as seen from a property — that is, they appear close to each other in the sky when you look toward them — there is a period each day when the sun passes behind both of them at once. The resident does not experience two separate episodes. They experience one sustained episode with blade shadows arriving alternately from two turbines at close to double the frequency of a single turbine. The duration of that overlap is determined by the angular separation between the two turbines as seen from the property. The sun moves at approximately 0.25 degrees per minute in azimuth. Two turbines separated by 4 degrees produce a simultaneous overlap window of approximately 16 minutes. Two turbines separated by 10 degrees produce approximately 40 minutes. These are not theoretical possibilities — they are geometric certainties that repeat on every suitable shadow day throughout the year.

9.5.2.1 How this analysis was carried out

Using the ITM coordinates published in the applicant's own Appendix 16-1, we calculated the bearing from each assessed receptor to each turbine within the applicant's stated study boundary of 1,630 metres. We applied the standard directional constraint used in all shadow flicker assessment — shadow flicker can only occur within 130 degrees either side of north, because the sun never passes through the southern arc at Irish latitudes. We excluded landowner receptors and receptors with zero shadow flicker results in the applicant's own model. For each remaining receptor with two or more turbines in zone, we calculated the minimum bearing separation between any two turbines and derived the simultaneous compound overlap window. This analysis uses only the applicant's own coordinates and their own stated study boundary. It requires no external data. Appendix 9-2 contains the full analysis.

9.5.2.2 What the analysis shows

- 44 of the 129 assessed properties lie within the shadow flicker zone of two or more turbines simultaneously, within the applicant's own 1,630 metre study boundary. Not one of these 44 properties has been assessed for compound shadow flicker.
- 19 properties are Critical — the two closest turbines appear within 10 degrees of each other in bearing, producing confirmed simultaneous compound flicker windows of between 4 and 39 minutes on every suitable shadow day.

- 18 properties are Severe — the two closest turbines are between 10 and 20 degrees apart, producing simultaneous compound windows of between 43 and 76 minutes per suitable day.
- 7 further properties have two or more turbines in zone with separations above 20 degrees.

The applicant's Chapter 16 contains no analysis of simultaneous multi-turbine shadow flicker. It does not acknowledge that multiple turbines can simultaneously cast shadow at the same property. The 30-minute daily threshold was designed for single-turbine exposure. There is no established threshold anywhere for compound multi-turbine shadow flicker. For a Critical-tier property experiencing a compound window of up to 39 minutes, without mitigation, that single episode accounts for the entirety of the permitted daily exposure and it arrives at a higher effective flicker frequency than any single turbine produces. The time-based threshold has no category for the character of compound exposure. Whether the system shuts down one turbine or two, the fact that two turbines produce an irregular, arrhythmic pattern at higher effective frequency is not captured by any threshold in this assessment.

The significance of compound shadow flicker goes beyond duration. It is a question of the character of the experience itself. A single turbine produces shadow flicker at a regular, predictable rhythm — one pulse per blade pass, at a consistent frequency. Research on photosensitive conditions identifies the brain's limited capacity to habituate to regular, predictable stimuli. Compound flicker from two turbines simultaneously breaks that rhythm entirely. Blade shadows arrive alternately from two machines in an irregular, arrhythmic pattern at close to double the frequency. That irregularity is precisely what the neurological research identifies as most potent — the mark-space ratio is disrupted, the stimulus becomes unpredictable, and the visual angle of successive blade passages is maximised (as set out in the Health Chapter submission: Harding et al. 2008; Voicescu et al. 2016). For a person with migraine photosensitivity, photosensitive epilepsy, or reactive tinnitus, compound shadow flicker from two or more turbines simultaneously is not a larger version of single-turbine exposure. It is a qualitatively different and more severe neurological stimulus. This assessment never describes it. The EIAR never assesses it.

It should also be noted that the 44 properties identified here are those within the applicant's stated 1,630 metre study boundary. The applicant's own software calculated shadow to 1,789 metres — a fact established in Section 9.4 of this chapter. Had the analysis been extended to that distance, the number of properties with compound multi-turbine exposure would be substantially higher.

The compound geometry at two of the most severely affected properties is examined in detail in the Case Studies

9.5.3 Cumulative assessment — two wind farms overlooked

EIAR Chapter 16 Section 16.2.5 states: *"There is no potential for overlap of the same receptor with any other proposed or operational wind farm developments."* The applicant's own Chapter 4 Table 4-2 lists two operational wind farms west of the site.

Table 4-2: Pending and Determined Wind Farm Planning Applications 20km from the Site.

Wind Farm	Consenting Authority	Planning Reference	Decision	No. Turbines	Distance from site approx. Km
Carrig (Lacka) Wind Farm	Tipperary	5123496	Granted (Conditional) - operational	3	c.1.7km
Skehanagh (Lacka) Wind Farm	Tipperary	5123495	Granted (Conditional) - operational	5	c.2.7km

Carrig Lacka Wind Farm sits approximately 1.7 km, and Skehanagh (Lacka) Wind Farm at approximately 2.7 km from the development site, eight turbines in total. The IWEA Best Practice Guidelines, cited by the applicant, require cumulative shadow flicker assessment for any wind farm within 2 km. The nearer of the two, Carrig (Lacka), is within that threshold.

The closest turbine of this operational cluster lies approximately 1,700 metres from T03. A coordinate-based check carried out for this submission, using the turbine positions published in the applicant's own documents and the receptor coordinates in Appendix 5-1, identifies 32 sensitive properties in the applicant's own dataset that fall within the combined shadow zones of Ballincor and these two existing wind farms.

The Ballincor turbines sit on bog at 43–63 m above sea level and cast shadows westward in the morning. The Carrig (Lacka) and Skehanagh turbines sit to the west of the site on higher ground and cast shadows eastward, toward Ballincor, in the afternoon. Properties between the existing farms and the proposed site can therefore receive shadow from opposing directions at different times of the same

day. No single-farm model can capture this combined exposure, and none has been attempted.

The statement at 16.2.5 — 'there is no potential for overlap with any other wind farm' — is demonstrably incorrect. Two operational wind farms lie immediately west of the site, the nearer of them within the applicant's own 2 km cumulative-assessment threshold. The statement was not a considered finding based on evidence; it was an unexamined assumption presented as fact, and it is contradicted by the applicant's own Chapter 4.

9.5.4 No Expected daily maximum figure

The Applicant asserts expected annual compliance on the basis of figures this submission contests. But even on their own terms, they have never calculated or disclosed whether expected daily compliance is achieved for the 30-minute-per-day limit. For 46 properties the worst-case daily maximum exceeds 30 minutes. The Expected daily equivalent — the figure that would show whether realistic sunshine conditions bring those properties within the daily limit — is simply absent from the assessment.

9.5.5 The 30-hour/year and 30-minute/day thresholds have no medical basis

The 30-hour per year and 30-minute per day thresholds applied in this assessment are not the applicable standard for a development of this scale. They are legacy administrative limits derived from German planning practice in the 1990s, developed for turbines of 50 to 80 metres in height. They have no medical basis. The Linden and Fouquet (2011) review found that no jurisdiction anywhere adopted them on the basis of clinical evidence

Research by Voicescu et al. (2016) found that the maximum daily duration of shadow flicker was a better predictor of health annoyance than the annual total — yet Ireland's primary metric is annual hours. The same research found that people with migraines, dizziness, and tinnitus have three times higher odds of shadow flicker annoyance.

9.6 — The Remedy Cannot Cure the Defect

The preceding sections have established a series of failures in the baseline data, in the modelling and in the reporting of Shadow Flicker impact by the Applicant. The Applicants expectation is a 'near zero' impact. The answer to any prospect of mild shadow flicker for receptors is the installation of an automatic shutdown system to prevent any non-compliance. This section explains why that answer, on its own merits, cannot be accepted as a planning basis.

The proposed shutdown system has never been verified against measured shadow flicker at this site; it cannot cover 56 properties the Applicant's own software calculated shadow for but did not include; it cannot reach the most severe daily events at elevated receptors; it does not address compound exposure from multiple turbines in any specified way. It is a system that will be operated and self-reported by the developer; that has no independent monitoring; that has no named enforcement body; that has no resident-accessible review mechanism; and that promises a "near zero" outcome the Applicant's own document defines in three irreconcilable ways. Each of these is set out below.

9.6.1. Mitigation is an unverified, developer-controlled promise

Before turning to the specific failures of the proposed system, An Coimisiún Pleanála is asked to understand the structural problem with how that system is presented throughout Chapter 16.

The worst-case figures in this assessment are not theoretical extremes. They are the Applicant's own calculated baseline — what will happen at these properties when the wind blows and the sun shines. Taking the three most affected receptors by annual shadow flicker:

- **Receptor 160:** 99 hours 59 minutes per year, shadow flicker on 212 days.

- **Receptor 17:** 83 hours 56 minutes per year, 182 shadow days.
- **Receptor 285:** 80 hours 45 minutes per year, 146 shadow days.

These are not edge cases. They are the starting point, the reality of what this development produces at the homes of people who live next to it.

An Coimisiún Pleanála is being asked to grant permanent planning permission for a 35 year development on the basis of a promise about future operational behaviour made by the developer about the developer's own system. That promise has never been independently tested. It has never been verified against actual measured shadow flicker at this site. It is not independently monitored. There is no named body responsible for checking it, and no specified mechanism if it fails. And as the sub-sections below demonstrate, it has structural gaps that mean it cannot deliver what it claims even if it functions exactly as described, including, most strikingly, a central "near zero" commitment that the Applicant's own Expected values show will be breached before the development is a year old (9.6.4).

The Board is asked to treat the mitigation as what it is, a conditional, unverified, developer-controlled promise, and not as the guaranteed outcome that Chapter 16 presents.

9.6.2 How the shutdown system actually works

The automatic shutdown system is calibrated against the 30/30 thresholds: 30 minutes per day and 30 hours per year. It shuts the turbines down when shadow flicker is predicted to exceed those limits, and the turbines run without restriction once the accumulated total is within them.

The consequence is that the system does not prevent harm; it permits harm up to a defined ceiling. Under a standard planning condition calibrated to these thresholds, a resident may lawfully experience up to 29 minutes of shadow flicker every day until the 30-hour annual cap is reached, on the order of 60 days per year at maximum daily

exposure. Below that ceiling, the shutdown system offers no protection at all. It does not eliminate flicker; it sets a level of flicker that is deemed acceptable under a threshold with no medical basis, derived from German administrative planning practice in the 1990s for turbines of 50–80 metres in height roughly a third of the height of the turbines proposed here.

This matters for a reason developed in 9.6.4: the system is calibrated to worst-case exceedance, not to the Applicant's Expected values. The "realistic" figures the Applicant relies on elsewhere to argue the impact is negligible play no role in when the system intervenes.

9.6.3 What the shutdown system cannot reach

Beyond how the system tracks accumulated exposure, there are categories of shadow flicker at this site that the shutdown system cannot address in principle — not because of a design flaw, but because they were never entered into the model that feeds it.

The shutdown system is calibrated from the WindPRO model. It can only respond to what the model recorded. It therefore cannot respond to what the model missed.

The 56 properties between 1,630 metres and 1,905 metres — identified in Section 9.4 of this submission — were excluded from the assessment entirely. They are not in the model. They are not in the shutdown system. They have no protection whatsoever. 18% of this community within 2 km of the site have zero protection from shadow flicker events because they were never assessed.

These are not modelling errors that can be corrected by recalibrating the shutdown system after permission is granted. They are structural absences. The system was never designed to cover them. Permission granted on the basis of this assessment would leave those exposures permanently unaddressed for the 35 year life of this development.

9.6.4 'Near zero' — a commitment that cannot mean what it says

The Applicant uses the term 'near zero' six times in Chapter 16 with at least three different meanings. They define it once — precisely and honestly — as the 1-2 minutes of shadow flicker that occurs while turbine blades physically decelerate to a stop after shutdown is triggered. That is a fair description of what the technology can achieve beyond zero.

But the applicant then immediately applies the same term to their overall commitment — 'the Applicant has committed to having near zero shadow flicker at any occupied dwelling.' That is a completely different claim. And the shutdown system that is supposed to deliver it is calibrated not to zero but to the 30/30 thresholds. Section 16.5.1 of Chapter 16 states explicitly that the system ensures 'mitigation is implemented if shadow flicker exceeds the thresholds as set out in the assessment criteria.' Those thresholds are 30 minutes per day and 30 hours per year. The system does not intervene until those thresholds are reached. 'Near zero' therefore means near zero above 30/30 — not near zero from the outset. A resident may experience up to 29 minutes of shadow flicker every day until the annual cap is reached. That is not 'near zero' by any ordinary meaning of the words.

There is a further and irreconcilable problem. If the applicant's own definition is taken at face value — 'near zero' means 1-2 minutes — then it cannot be reconciled with their own Expected values. The appendix records Expected annual shadow flicker of up to 15 hours 50 minutes at the most affected non-landowner property. On the applicant's own definition, their Expected values show they will breach their own commitment before the development is a year old. Either the definition is wrong, the commitment is wrong, or the Expected values are wrong. The applicant cannot have all three.

By Section 16.7 the same term is used to justify a finding that cumulative shadow flicker impact is negligible. The word has done three different jobs in the same chapter.

An Coimisiún Pleanála cannot determine from Chapter 16 *what* the applicant is actually committing to. A commitment whose meaning cannot be determined from the document that contains it is not an enforceable commitment — and cannot form the basis of a planning condition.

9.6.5 The Cloghan precedent — what planning conditions actually deliver

Cloghan Wind Farm in Co. Offaly is directly relevant. The operator confirmed its shadow flicker system was operating as per the planning condition. Offaly County Council received 270 complaints, suppressed for two years before release under FOI. The Cloghan experience shows that a planning condition on paper and actual protection for residents are not the same thing.

The Board is asked to note what Cloghan demonstrates about the enforcement architecture of a shadow flicker planning condition. The developer self-reports. The planning authority has no independent means of verifying compliance. Residents who believe the system is failing have no formal mechanism to trigger review. The complaints they made were not acted upon for two years and were suppressed when made. That is not a compliance framework. That is a framework in which non-compliance is the path of least resistance for the developer and the path of maximum difficulty for the resident.

Nothing in the Applicant's Chapter 16 proposes anything different from the Cloghan model. The shutdown system will be operated by RWE. Compliance will be self-reported by RWE. There is no named independent body. There is no physical measurement at receptor level. There is no mechanism for residents to trigger review. There is no specified consequence for non-compliance beyond the general planning enforcement powers of the planning authority — powers which, as Cloghan demonstrated, are slow, opaque, and resident-hostile in practice.

9.6.6 The promise cannot be accepted as a planning basis

The Applicant's own worst-case figures show 41 receptors exceeding the annual limit and 46 exceeding the daily limit. Against that, the entire compliance case rests on a single shutdown system. That system:

- has never been verified against measured shadow flicker at this site;
- does not cover the 56 properties the Applicant's own software calculated shadow for;
- does not reach the most severe daily events at elevated receptors;
- addresses compound exposure from multiple turbines in no specified way;
- will be operated and self-reported by the developer;
- has no independent monitoring;
- has no named enforcement body;
- has no resident-accessible review mechanism; and
- rests on a "near zero" commitment that the Applicant defines three different ways and that the Applicant's own Expected values contradict.

The Cloghan experience shows what this architecture produces in practice. The "near zero" commitment shows what the language of that architecture means when examined. And the structural gaps set out above show that the system cannot deliver what it promises even on its own terms.

This is not a defect that a planning condition can cure, and that is the decisive point. The standard remedy available to the Board — attaching a 30/30 condition and a shutdown scheme — *is* the scheme being challenged here. Conditioning the permission in the ordinary way would reproduce the exact framework that failed at Cloghan: developer-operated, self-reported, unmonitored, and unenforceable in practice.

For that reason, the Applicant's mitigation cannot be accepted as a planning basis, and the application as submitted should be refused. At a minimum, no permission should issue unless and until: the assessment is redone with the 56 excluded properties included; compound exposure at multi-turbine receptors is properly modelled; and any mitigation scheme is independently verified against measured flicker at receptor level, independently monitored, made enforceable through a named responsible body, and equipped with a review mechanism that residents can themselves trigger. Absent those safeguards, the grant of permission would not be a planning judgment that the impacts are acceptable. It would be a transfer of risk — from the developer, who profits, to the residents, who bear it.

9.7 — LEGAL FRAMEWORK

Shadow flicker constitutes actionable private nuisance in Irish law. It enters the home through windows, engaging Article 40.5 of the Irish Constitution (inviolability of the dwelling) and Article 8 of the European Convention on Human Rights (the right to private and family life). It is caused by a commercial installation for the benefit of a third party. The affected residents derive no benefit from it.

The Court of Justice of the European Union has held, in *Commission v Ireland* cases C-50/09 and C-427/07, that deficiencies in environmental assessment cannot be cured by post-permission monitoring.

Case: *European Commission v Ireland*, Case C-50/09, Judgment of 3 March 2011. The competent authority must not merely identify and describe environmental effects; it must assess them appropriately, and the assessment must be carried out before consent. The judgment summary also says that, to satisfy Article 3, the competent environmental authority “may not confine itself to identifying and describing” effects, but must assess them appropriately in each individual case.

Case: *Commission of the European Communities v Ireland*, Case C-427/07, Judgment of 16 July 2009.

Projects likely to have significant environmental effects must be subject to development consent and environmental assessment before consent is given. It also confirms the need for clear, binding transposition and public rights.

This is directly applicable here. The deficiencies identified in this submission are not minor gaps that a monitoring condition could address. They go to the structural foundation of the assessment — the methodology applied, the data withheld, the geometry misrepresented. No monitoring condition can retrospectively correct an assessment that was structurally incapable of measuring what it was supposed to

measure. Monitoring can only tell you how much shadow flicker is occurring after the development is built. It cannot substitute for an assessment that accurately described how much shadow flicker would occur before permission was granted. The assessment submitted does not accurately do so — as this submission has demonstrated from the applicant's own documents.

Granting planning permission on the basis of an assessment that demonstrably underestimates actual exposure does not extinguish residents' rights in nuisance law. A planning permission is not a licence to cause nuisance.

9.7.1 The 2019 Draft Wind Energy Development Guidelines

The 2019 Draft Wind Energy Development Guidelines state that no existing dwelling should experience shadow flicker as a result of a wind energy development. The applicant quotes this in their own EIAR and correctly notes that under the 2019 approach 'no amount of shadow flicker per day or per year would be acceptable.' They then assess the entire development against the 2006 thresholds.

The Board is invited to impose the zero-flicker standard the guidelines describe and to note that the assessment submitted does not meet it.

9.8 - CASE STUDIES — TWO HOUSEHOLDS

The chapter thus far has established a series of failures in the applicant's shadow flicker assessment, each verified from the applicant's own documents. This section brings those findings together at the level of individual households.

These are not abstract receptor numbers. They are occupied homes with people whose quality of life inside their homes will be severely affected for a commercial gain that they will not benefit from. The figures used in these case studies come from the applicant's own Appendix 16-1. Where the Applicant's Expected annual figures are referenced, they are included only to demonstrate that even on their own contested and unverifiable numbers, the exposure at these properties is severe. The worst-case figures, the Applicant's own calculated baseline for what will happen at these homes, are the operative basis on which this submission asks An Coimisiún Pleanála to assess the impact. The Expected figures are what the Applicant promises mitigation will achieve.

9.8.1 Case Study 1 — Receptor 285

This property sits on rising ground to the west of the proposed turbine cluster. Five turbines would be visible from it within the applicant's own study boundary, ranging from 812 metres to 1,627 metres away. They span a wide arc of the northern and north-eastern sky as seen from the property.

Shadow flicker would affect this household on approximately 146 days of the year — roughly five months, concentrated in autumn and winter. That figure comes from the applicant's own software output. It does not appear anywhere in Chapter 16.

Four of the five turbines in this property's zone sit on lower ground than the property itself. Their rotors begin below the observer's eye level. This means shadow flicker

from those four turbines arrives when the sun is low in the sky. The most severe shadow events at this property — the longest, most horizontal and most penetrating, producing the most intense flicker — are precisely those that the applicant's assessment reduces to a single annual hours figure, conveying nothing of their intensity.

The two closest turbines as seen from this property are separated by just 1.1 degrees of bearing — the tightest turbine pair anywhere on the site. On every suitable shadow day there is a window of several minutes during which both are simultaneously casting shadow through this property's windows. The occupant does not experience two separate episodes. They experience a single sustained episode at close to double the normal flicker frequency. The shutdown system tracks cumulative exposure per receptor and would intervene when the combined daily total approaches 30 minutes. But it has no mechanism to respond to the character of the exposure — the irregular, arrhythmic pattern from two turbines simultaneously is not a threshold that exists anywhere in the assessment.

What this assessment does not tell the resident of this property is what that experience will actually feel like. It does not say that two turbines will be flickering simultaneously, that the rhythm will be doubled and irregular, or that this arrhythmic compound stimulus is precisely the type identified in peer-reviewed research as most likely to trigger a neurological response in photosensitive individuals. A single annual hours figure tells you nothing about any of this.

The applicant's own worst-case annual figure for this property is 80 hours 45 minutes. Their Expected figure — which this submission contests — is 14 hours 26 minutes. Even on the applicant's own unverified Expected figures, this is one of the highest exposure figures in the entire assessment.

Chapter 16 does not tell the inspector:

- That shadow flicker affects this property on 146 days per year — approximately five months
- That four of the five contributing turbines appear at or below the observer's horizon, meaning the most severe shadow events arrive at the lowest sun angles

- That this property faces the tightest compound turbine geometry on the entire site
- That the shutdown system's response to simultaneous compound flicker from two turbines has never been specified

9.8.2 Case Study 2 — Receptor 261

This property sits on the eastern arc of the site. Four turbines lie within the applicant's study boundary. Shadow flicker affects this household on 185 days of the year — just over six months.

That figure, 185 shadow days, does not appear anywhere in Chapter 16. Table 16-1 records 65 days on which shadow flicker exceeds the 30-minute daily threshold. The remaining 120 days, on which shadow flicker occurs but lasts less than 30 minutes, are invisible in the chapter. A reader of Chapter 16 would have no idea that this household experiences shadow flicker as a recurring feature of more than half the year.

All four turbines in this property's zone sit on lower ground than the property. Every single one has its blade bottom below the observer's eye level. Every turbine affecting this property appears at or below the observer's horizon. Shadow flicker from all four begins when the sun is at its lowest — the most severe conditions, producing the longest and most horizontal shadows.

Two of the four turbines produce a confirmed compound overlap window of approximately 29 minutes on every suitable shadow day — a window that arrives when the sun is low and the flicker is at its most intense.

What this assessment does not acknowledge is that for the resident of this property, those 29 minutes are not 29 minutes of predictable, single-turbine shadow. They are 29 minutes of overlapping shadow from two turbines simultaneously — an unpredictable, arrhythmic experience that the neurological research identifies as

distinctly more potent than the same duration from a single source. That distinction is nowhere in the document presented to this Board.

The worst-case annual total is 75 hours 40 minutes.

Chapter 16 does not tell the inspector:

- That shadow flicker affects this property on 185 days per year — more than half the year, for over six months
- That the observer's eye level is above the blade bottom of every turbine in the calculation zone without exception
- That shadow flicker from all four turbines begins at the lowest sun angles, when shadows are longest, most horizontal, and most penetrating
- That a confirmed 29-minute compound window exists on every suitable day and has never been assessed

9.8.3 What these two properties have in common

Each tells a different story. Receptor 285 carries the most severe compound geometry on the site. Receptor 261 has the greatest frequency — 185 shadow days, more than half the year, 120 of which were not reported to the Board.

What they share is this. In both cases the picture presented in Chapter 16 is materially incomplete. In both cases the complete picture is in Appendix 16-1 and requires nothing more than reading the columns the applicant chose not to reproduce. And in both cases compound multi-turbine exposure has never been assessed.

An Coimisiún Pleanála cannot grant planning permission on the basis of an assessment that has systematically left the most significant findings of its own software output out of the document presented to the planning authority.

9.9 — CONCLUSION: WHY THIS APPLICATION CANNOT PROCEED

This submission has examined the shadow flicker assessment placed before An Coimisiún Pleanála for the proposed Ballincor Wind Farm and has found it wanting at every level on which such an assessment must be sound: its data, its methodology, its geometry, the completeness of what it reports, and the mitigation offered to cure its defects. Every finding was reached by reading what the applicant wrote, checking it against what the applicant's own software produced, and carrying out the arithmetic that follows from the figures the applicant itself published.

The assessment fails first at its foundation. Every claim of compliance in Chapter 16 rests on a single arithmetic step — the worst-case modelled hours reduced by a sunshine probability fraction — and that fraction is wrong. The EIAR attributes it to a station 83 kilometres away whose record ends in 2006, while the model in fact ran data from a different station entirely; the two are irreconcilable, and no reader can reconstruct the compliance figures from the source the EIAR itself cites. In any event neither station is the right one. Gurteen, 4.5 kilometres from the site and recording continuously since 2008, shows 27.5% more annual sunshine than the data the model used. Correct that single input and the margin of compliance narrows at every receptor. Worse, the method by which the sunshine and wind-direction fractions are combined to produce the compliance figures has never been disclosed anywhere in the application — no formula, no worked example — so an inspector cannot verify how a single figure in Table 16-1 was arrived at. The compliance case is built on an input that is wrong and a derivation that has never been shown.

It fails next in its geometry. The model assumes the standard arrangement — turbines above, homes below, shadows breaking up across the landscape — and applies it to a site where the opposite is true. Residents do not look up at these machines; they look across at, or into, the lower arc of the rotor. That single fact invalidates the 1,630-metre study boundary, which was drawn for flat terrain and which the applicant's own software overran in every scenario, reaching as far as 1,905 metres. Fifty-six properties sit in the gap the software calculated but the assessment ignored; two more sit exactly on the line and were excluded without a word; one more was plotted on the applicant's own map and never modelled at all. Fifty-eight homes the applicant itself identified were never assessed.

It fails next in what it reports. The applicant's software produced, for every property, the total number of days each year on which shadow flicker occurs. That column appears nowhere in

Chapter 16. The consequence is not a technicality: thirty-four homes that the appendix records as experiencing shadow flicker on between 25 and 147 days a year appear in the chapter as entirely unaffected, and homes that do breach the daily limit are shown with a fraction of the affected days the appendix records. A planning authority reading Chapter 16 in good faith would form a materially false impression of the scale of this impact. To this is added a category of harm the assessment does not acknowledge exists. On the applicant's own coordinates, 44 properties lie within the simultaneous shadow zone of two or more turbines, yet compound flicker — two machines casting through the same window at once, in the irregular, arrhythmic, high-contrast pattern that the photosensitivity research identifies as most potent — is assessed nowhere. The cumulative assessment fares no better: Chapter 16 states there is no potential for overlap with any other wind farm, while the applicant's own Chapter 4 lists two operational wind farms immediately to the west, the nearer of them inside the applicant's own two-kilometre threshold. And although the applicant claims annual compliance, no Expected daily maximum has ever been calculated for the 46 properties whose worst-case daily exposure exceeds the limit.

These are not isolated faults, and the pattern they form is the most telling fact in this submission. Every error runs in the same direction. Not one of the failures identified here makes the impact appear larger than the applicant's own data supports; every one makes it appear smaller. A wrong sunshine input, an undisclosed method, an inverted geometry, an under-drawn boundary, a missing data column, an unassessed category of harm, a denied cumulative overlap, a threshold with no clinical foundation each, independently, would call the assessment into question. Taken together, and all pointing one way, they establish that the document does not describe the impact this development will have on the people who live beside it.

To all of this the applicant's answer is a single one: an automatic shutdown system will hold the figures within the limits. It cannot. The system is calibrated to the 30/30 thresholds, not to zero, so it permits up to 29 minutes of flicker a day until the annual cap is reached; it can respond only to what the model recorded, so it is structurally blind to the 58 unassessed homes, the sub-threshold days, and the compound exposures the model never measured; and it will be operated and self-reported by the developer, with no independent monitoring, no named enforcement body and no resident-accessible review. The Cloghan precedent shows exactly what this architecture produces in practice.

The two households set out in the case studies show what these failures mean once they leave the page. At Receptor 285, the tightest turbine pairing on the site casts overlapping

shadow through the windows on 146 days a year, a figure that appears nowhere in Chapter 16. At Receptor 261, shadow flicker recurs on 185 days, more than half the year, of which 120 were never reported to the Board, with every contributing turbine sitting below the observer's horizon so that the worst events arrive at the lowest, longest, most penetrating sun angles. Neither household is an abstraction. They are occupied homes whose quality of life indoors will be materially diminished for a commercial benefit their occupants will never share — and the full extent of that diminution was available to the applicant, in the applicant's own appendix, and was left out of the document placed before this Board.

The residents of the assessed properties are entitled to an environmental assessment that describes, accurately and completely, the impact this development will have on their homes. They have not received one. The assessment's stated methodology does not match the methodology it applied; its compliance figures rest on a derivation never disclosed; its central mitigation commitment means three different things in the chapter that defines it; and its omissions, without exception, understate the harm.

An Coimisiún Pleanála is therefore asked to refuse permission for this development. The shadow flicker assessment submitted in support of the application does not meet the legal standard required to sustain a grant of permission, and its defects are of a kind that cannot be corrected by any condition attached after the fact. Should a revised application ever be brought forward, the residents are entitled to expect what this one failed to provide: an assessment that begins from the correct site geometry, uses accurate, local and contemporary meteorological data, discloses its method in full, assesses compound and cumulative exposure, and presents the complete output of its own modelling rather than the selected portion of it that has been placed before this Board.

APPENDIX 3: Biodiversity

Chapter 6 Biodiversity

- Appendix 6-1: Croneen Trout Little Brosna 2021**
Appendix 6-2: Wild Trout Trust – letter of concern

6.1: Approach and Methodology

This chapter addresses the biodiversity and ecological aspects of the Ballincor Wind Farm application. Six Key Ecological Receptors (KERs) are addressed. The chapter is built entirely from the developer's own submitted documents and the statutory and scientific material against which those documents are assessed. No independent survey data is introduced. Where a deficiency is identified it is demonstrated by reference to specific paragraphs, tables, and pages within the application or by reference to a requirement placed on the developer by the NPWS, Inland Fisheries Ireland, or applicable guidance that the submitted material fails to meet. This report is long because the issues are complex and numerous.

6.1.1 The Legal Context

The proposed development requires Appropriate Assessment under Article 6(3) of the EU Habitats Directive. An Coimisiún Pleanála can only grant consent after it has ascertained, beyond reasonable scientific doubt, that the development will not adversely affect the integrity of any European site. Two features of this application make that standard especially exacting. First, the developer has expressly waived both available derogation pathways. Article 4.7 of the Water Framework Directive and IROPI. If adverse effects on any European site cannot be excluded on the evidence submitted, refusal is the only lawful outcome.

Second, the developer's own EIAR acknowledges, in respect of more than one KER, impacts of potentially fatal magnitude to the ecological feature concerned and then proposes mitigation to bridge that gap. The CJEU held in *People Over Wind* (C-323/17, 2018) that mitigation measures cannot simply be assumed to work — they must be assessed in full within the Appropriate Assessment. Where the mitigation is speculative, unproven, or dependent on conditions outside the developer's control, it cannot carry the legal weight placed on it.

6.1.2 The Five-Phase Analytical Framework

To fully examine each KER a consistent five-phase analytical approach was undertaken.:

- **Phase A — What was required:** the legal baseline, NPWS and IFI scoping requirements, and methodologies the developer committed to follow.
- **Phase B — What did they do** – the survey effort: whether surveys were conducted at the right time, by the right methods, with adequate coverage, and over a sufficient period.
- **Phase C — Data analysis:** whether the data collected was correctly interpreted and whether the developer's own conclusions are internally consistent.
- **Phase D — Mitigation:** whether the proposed mitigation measures are capable of achieving the claimed residual effect, tested against the People Over Wind standard.
- **Phase E — Grounds for objection:** the specific, referenced deficiencies arising from the foregoing analysis, with the legal standard engaged and what the developer would need to demonstrate to cure each ground.

6.1.3 Legal Standards Applied

The following standards are applied throughout. They are stated here once and are not repeated in full in each KER section.

- Habitats Directive Article 6(3): no consent unless adverse effects on European site integrity are excluded beyond reasonable scientific doubt.
- Waddenzee (C-127/02): precautionary principle applies; the burden lies on the developer to demonstrate no adverse effect, not on the objector to prove one.
- Sweetman (C-258/11): a project adversely affects integrity if it prevents lasting preservation of the site's constitutive characteristics.
- Holohan (C-461/17): the Appropriate Assessment must be complete, precise and definitive, free of lacunae.
- People Over Wind (C-323/17): mitigation measures cannot be assumed to work; they must be assessed in full within the AA.
- Hellfire Massey (ECLI:EU:C:2023:545): where a derogation licence under Regulation 54 is necessary, it must be obtained before the grant of planning permission.
- Weser (C-461/13): the WFD non-deterioration obligation prohibits any fall in waterbody status class.
- Inland Fisheries Ireland and NPWS Scoping Responses: establishes the species-specific and site-specific requirements against which survey adequacy is assessed.

6.2 KER 1 — Marsh Fritillary (*Euphydryas aurinia*)

6.2.1 Legal Status

Marsh Fritillary is listed on Annex II of the EU Habitats Directive, requiring designation of SACs for its habitat. It is also listed on Appendix II of the Bern Convention, which strictly prohibits deliberate disturbance during breeding, rearing, and hibernation wherever the species is found — not only within designated sites. The developer acknowledges both designations in EIAR Chapter 6.

The national conservation status of Marsh Fritillary is recorded as "inadequate" overall with "inadequate" future prospects in the NPWS 2019 Article 17 report, cited by the developer. The NPWS 2025 status assessment confirms this position is unchanged. Both legal frameworks were active on this site and required engagement.

6.2.2 What Was Required

The NPWS scoping response does not contain a species-specific Marsh Fritillary section. The developer elected to meet the general survey obligation by reference to three external documents that thereby became the primary benchmarks for adequacy:

- NRA (2008) — Ecological Surveying Techniques for Protected Flora and Fauna: required targeted survey during the adult flight period and fencing of retained habitat during construction.
- NBDC Marsh Fritillary Monitoring Scheme (2021): specified late August to early September as the optimal larval web survey window; recommended repeated annual surveys due to interannual population variability.
- Phelan et al. (2021) — Ireland's Butterfly Series: established that adults are active from the second week of May to early June, are largely sedentary (rarely exceeding 100 m dispersal), and require at least three well-developed Devil's-bit scabious plants per m² over more than 20% of the habitat for breeding.

By committing to these documents, the developer accepted their standards as its own benchmark. Failure to meet them is a failure against the developer's own stated methodology.

The CEMP (Appendix 2-3) and EIAR Chapter 6 also committed to three pre-construction surveys — including an updated larval web survey and adult monitoring in May–June — which implicitly acknowledge that the 2023 baseline did not reflect construction-time conditions.

6.2.3 Survey Effort

The developer conducted a single targeted Marsh Fritillary survey in September 2023. This is the entirety of dedicated survey effort for an Annex II species across a five-year survey programme (2020–2025). Seven larval webs were found at two discrete locations.

The most significant gap is the complete absence of any adult butterfly survey. The developer conducted multidisciplinary walkover visits in May 2022, May/June 2023, and April 2024, during or adjacent to the adult flight period but none included a targeted adult survey. No transect counts, timed adult searches, or flight activity monitoring were undertaken in any year. This gap is not acknowledged or explained in the EIAR.

The baseline also rests on a single season. The NBDC Monitoring Scheme (the developer's own cited guidance) recommends annual surveys because single-year counts are unreliable. The developer acknowledges at EIAR Section 6.6.3.3.1 that "the exact positions of larval webs in future years cannot be anticipated at this time", a direct admission that the 2023 data may not reflect conditions at construction. Despite the time and opportunity no repeat survey was conducted in 2024 or 2025.

6.2.4 Data Analysis — The Developer's Own Conclusion of Total Population Loss

The pivotal passage in the assessment is EIAR Section 6.6.3.3.3, which states:

"The cumulative effects of the direct habitat loss combined with indirect habitat degradation are likely to be profoundly negative and permanent, leading to the total loss of the local breeding population of Marsh Fritillary as well as the total loss of 0.32 ha of suitable Marsh Fritillary habitat, within the proposed wind farm site."

This conclusion is reached by two independent and cumulative routes: 69% of Marsh Fritillary habitat is directly destroyed; the remaining 31% (0.1 ha) falls entirely within the developer's own 30-metre NatureScot peatland drainage buffer and is characterised as "likely to be permanently and profoundly degraded." Neither route is disputed anywhere in the submitted documents.

This same section then refers, in the residual effects assessment, to "the retained Marsh Fritillary population" colonising the receiving site. A population cannot simultaneously be totally lost and retained for colonisation. This contradiction is not resolved.

Receiving site figures are also internally inconsistent: EIAR Chapter 20 MM51 commits to 4.8 ha; BEMP Appendix 6-1 states 2 ha, The NIS residual effects assessment uses 4.8 ha. The actual commitment is indeterminate on the face of the submitted documents.

6.2.5 Mitigation Assessment

Both derogation pathways have been waived, making the mitigation the sole legal mechanism available. The developer proposes four mitigation measures. None meets the People Over Wind standard.

- MM50 (pre-construction vegetation cutting) is designed to disperse adults. The developer simultaneously states that adults "are largely sedentary and rarely fly more than 100 m" and that Devil's-bit scabious was absent from all areas of the site other than the two mapped locations. Adults displaced by cutting have nowhere viable to go within their dispersal range.
- MM48 (larval web translocation) directs larvae into the same 0.1 ha the developer has concluded will be permanently degraded. The developer's own cited authority — Butterfly Conservation (2023) — states that "translocations to permit the destruction of sites occupied by rare and threatened species is unacceptable." No demonstrated evidence base for the method in Irish wet grassland conditions is provided.
- MM51 (receiving site management) proposes to restore a site the developer describes as "species-poor" and devoid of Devil's-bit scabious. No timeline for achieving the required foodplant density is provided. No legally enforceable management agreement is evidenced. The 30-metre drainage buffer — applied to condemn the retained habitat — is not applied to assess whether the receiving site's own hydrology will be disrupted.
- The monitoring programme reports without requiring response. No trigger point mandates corrective action. No lawful post-consent remedial mechanism exists.

6.2.6 Grounds for Objection

Ground 1 — Inadequate baseline — no adult butterfly survey conducted : No targeted adult Marsh Fritillary survey was conducted during the May to June flight period in any year. EIAR Table 6-3 records a single Marsh Fritillary survey entry: September 2023. The omission is not acknowledged or explained anywhere in the submitted documents. Without adult survey data, population size, site distribution, dispersal patterns, and flight activity are all unknown. Holohan (C-461/17, para.44): the Appropriate Assessment must contain complete, precise and definitive findings; an assessment excluding all adult-stage data cannot be complete.

Ground 2 — Inadequate baseline — single-season larval web data acknowledged as

insufficient by the developer: The larval web baseline rests on one survey visit in September 2023. The developer states at EIAR Section 6.6.3.3.1 that "the exact positions of larval webs in future years cannot be anticipated at this time" — a direct admission that the 2023 data may not reflect construction-time conditions. No repeat survey was conducted in 2024 or 2025. NBDC Marsh Fritillary Monitoring Scheme (developer's committed methodology): recommends repeated annual surveys because single-year counts are unreliable for this species. Holohan (C-461/17, para.44): the assessment must be free of gaps. A baseline the developer itself acknowledges may not reflect construction-time conditions is a gap of the first order.

Ground 3 — Developer's own logic leads to total probable population loss — the impact

conclusion is not resolved : EIAR Section 6.6.3.3.3 concludes that "the cumulative effects of the direct habitat loss combined with indirect habitat degradation are likely to be profoundly negative and permanent, leading to the total loss of the local breeding population." This conclusion is the developer's own, reached by two independent routes — direct destruction of 69% of habitat and hydrological degradation of the remaining 31% within the developer's own 30-metre drainage buffer. Neither route is disputed in the submitted documents. Sweetman (C-258/11, para.48): a project adversely affects site integrity if it prevents lasting preservation of the constitutive characteristics of the site. Bern Convention Appendix II (acknowledged by developer at EIAR Section 6.6.3.3): prohibits deliberate disturbance during breeding. The destruction of 100% of occupied habitat during the larval stage is disturbance during breeding in its most direct form.

Ground 4 — Internal contradiction — "retained population" and "total population loss" used

simultaneously EIAR Section 6.8.3 refers to "the retained Marsh Fritillary population" colonising the receiving site after mitigation. EIAR Section 6.6.3.3.3 concludes that total loss of the local breeding population is the likely cumulative outcome. A population cannot be simultaneously totally lost and retained for colonisation. The contradiction is not acknowledged or resolved anywhere in the submitted documents. Holohan (C-461/17, para.44): the assessment must contain complete, precise and definitive findings free of lacunae. An assessment that reaches contradictory conclusions on the central factual question — whether the local population survives — contains a lacuna of the most fundamental kind.

Ground 5 — Inconsistent receiving site figures across submitted documents — 4.8 ha vs 2

ha EIAR Chapter 20 MM51 commits to managing 4.8 ha as receiving site. BEMP Appendix 6-1 Section 4.2.3 states 2 ha. The NIS and residual effects assessment use 4.8 ha. The documents are irreconcilable. The competent authority cannot determine what area is actually committed to management or whether the residual effect calculation in the NIS is built on the correct figure. Holohan (C-461/17, para.44): the assessment must be complete, precise and definitive. A key mitigation commitment stated differently in two submitted documents is neither precise nor definitive

Ground 6 — MM50 — pre-construction vegetation management is self-defeating given the developer's own account of the species' biology

MM50 proposes cutting habitat to below 12 cm to encourage adults to disperse. The developer states in the same measure that adults "are largely sedentary and rarely fly more than 100 m" and records Devil's-bit scabious as absent from all areas of the site other than the two mapped Marsh Fritillary locations. No suitable habitat exists within effective dispersal range. The measure displaces a sedentary species into a landscape the developer confirms has no suitable dispersal destination. People Over Wind (C-323/17, 2018): mitigation cannot be assumed to work. The developer has not demonstrated that MM50 can work because, on its own account of the species' biology and surrounding habitat, it cannot.

Ground 7 — MM48 — translocation proceeds against the developer's own cited authority, directed at habitat already condemned as permanently degraded

EIAR Section 6.7.1.5.6.4 quotes directly from Butterfly Conservation (2023): "Butterfly Conservation considers that translocations to permit the destruction of sites occupied by rare and threatened species is unacceptable." The developer proceeds regardless, without reasoning why this position does not apply. The translocation destination — the retained 0.1 ha — is the same habitat the developer has concluded will be permanently and profoundly degraded. Translocating larvae into condemned habitat does not protect them. People Over Wind (C-323/17, 2018): mitigation must be assessed in full. A protocol proposed against the explicit position of the principal specialist body, directed at a destination already characterised as permanently degraded, has not been assessed as capable of working

Ground 8 — MM51 — receiving site lacks the larval foodplant and has no enforceable management agreement

The receiving site is described at MM51 as "species-poor." EIAR Section 6.7.1.5.6.10 confirms "no records of Devil's-bit scabious were recorded during the field surveys outside of the donor sites." The receiving site lacks the essential larval foodplant. The

timeframe for achieving the required density (at least three well-developed plants per m² over more than 20% of the habitat) following turve translocation into Molinia-dominated grassland is not stated. No legally enforceable management agreement binding any landowner to the 15-60 year regime is evidenced. People Over Wind (C-323/17, 2018): mitigation must be assessed in full. A receiving site without the required foodplant, without a demonstrated establishment timeline, and without an enforceable management commitment has not been assessed as capable of delivering the claimed residual effect.

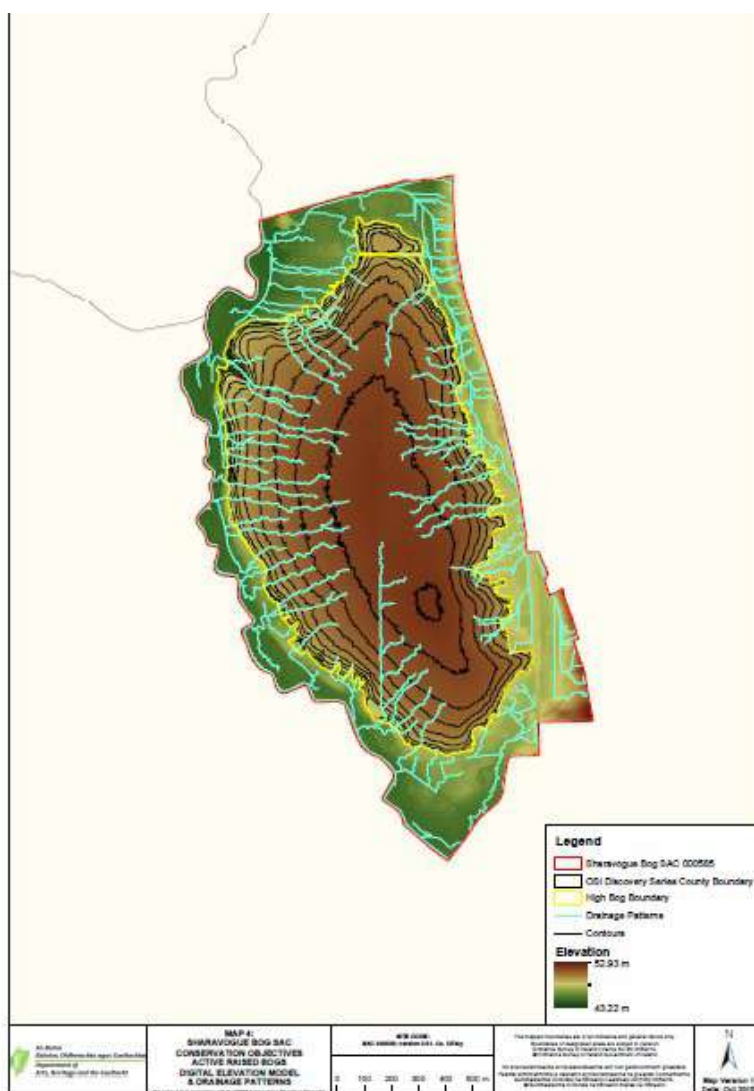
6.2.7 Conclusion — KER 1 Marsh Fritillary

The developer's own assessment concludes that the cumulative effect of direct habitat destruction and indirect hydrological degradation is likely total loss of the local Marsh Fritillary breeding population. The mitigation measures offered cannot bridge that conclusion to a no-adverse-effect finding; they are collectively directed at an impact characterised as catastrophic, using a receiving site devoid of the larval foodplant, without an enforceable management agreement, against the explicit position of the principal UK invertebrate conservation body, and with contradictory assumptions about whether any population survives to be displaced. With both derogation pathways waived, refusal is the only lawful outcome on KER 1 as submitted.

6.3: KER 2 — Sharavogue Bog SAC (Site Code 000585)

6.3.1 Legal Status and Site Description

Sharavogue Bog SAC is designated for three Annex I habitat types, one of which is a priority habitat: Active Raised Bog [7110*], Degraded Raised Bog still capable of natural regeneration [7120], and Depressions on peat substrates of the Rhynchosporion [7150]. The SAC boundary is located at its nearest point approximately 10 metres from the proposed wind farm site boundary. Turbine T8 is approximately 0.1 km from the SAC boundary. Sharavogue Bog and its hydrological context is presented below. The River Brosna acts as its eastern boundary and the map below shows the complex nature of its hydrological drainage system and its relationship with the river. Given that similar raised bog and extensive drainage patterns exist within the windfarm site it is not unreasonable to assume a hydrological connection. This is before we consider the Floodzone A/B context of the proposed site and all that it suggests.



Critically, the conservation objective for Active Raised Bog at this site is restoration, not maintenance. Active Raised Bog has increased from 25.8 ha toward a target of 40.9 ha through a programme of drain-blocking that was 90% complete at the time of application. This is a site in active, State-funded ecological recovery. The Article 6(3) test must be applied to a receptor that is hydrologically sensitive, actively recovering, and dependent on stable groundwater conditions to achieve its statutory restoration targets.

6.3.2 What Was Required

A pre-planning Consultation between the Applicant and ACP was held in May 2025. See below.

**An
Bord
Pleanála**

Record of 2nd Meeting
ABP-318666-23 (PC)

Case Reference / Description	ABP-318666-23 - Proposed development of 11 Wind Turbines, Ballincor Wind Farm County Tipperary and County Offaly.		
Case Type	Pre Application Consultation		
1st / 2nd / 3rd / 4th Meeting	2 nd Meeting		
Date	07/05/2025	Start Time	11:00am
Location	MS Teams	End Time	12:00pm

The following point of discussion was raised:

- Following on, the Board's representatives noted the proximate Special Area of Conservation to the site and advised the prospective applicant to undertake comprehensive surveys and provide detailed examination of same to facilitate the consideration of the proposed development.
- The Board's representatives advised the prospective applicant to robustly address other environmental considerations as they relate to groundwater, surface water and soil, as a portion of the site is included within the Geological Survey Ireland (GSI) mapping database as susceptible to landslides.

This was a full year before the Application was made.

The NPWS scoping response named Sharavogue Bog SAC by site code and required a full hydrogeological assessment of the connectivity between the proposed development and the SAC. It specified the hydrological parameters that must be protected: mean water level at or near the surface of bog lawns for most of the year; seasonal fluctuations not exceeding 20 cm

and only 10 cm below surface except for very short periods. These parameters define the conservation objective standard. Any assessment of groundwater impact must be measured against them. The scoping response also stated that there can be no lacunae in the NIS and that mitigation details must be available before the planning decision, not agreed post-consent.

6.3.3 Survey Effort

No groundwater monitoring was conducted at or near the SAC boundary at any point during the application period. All seven months of groundwater level monitoring (June 2024 to April 2025) were confined within the wind farm site boundary. No ecological or botanical survey of the SAC lagg zone was conducted. No geotechnical investigation was conducted in the transitional zone between the site and the SAC. The assessment of potential groundwater impact on the SAC was made entirely from within the site boundary, without any measurement at the receptor end of the identified pathway.

6.3.4 Data Analysis

6.3.4.1 *The NIS Internal Contradiction and the 100-Metre Zone of Influence*

NIS Table 6-1 (p.118) records: "a potential for adverse effect was therefore identified" and "Yes — A viable pathway for effect (via physical and hydrogeological connectivity) was identified between the proposed project site and this SAC. There is potential for likely significant effects on this SAC." NIS Table 6-2 (p.120) then dismisses all potential for adverse effects on the hydrological regime, water quality, transitional areas, and all other attributes of the Active Raised Bog qualifying interest without any intervening mitigation measure, engineering change, or new hydrogeological analysis. The groundwater pathway confirmed in Table 6-1 simply does not appear in Table 6-2 for those attributes. That is a lacuna under Holohan (C-461/17, para.44) irrespective of the invasive species row. There is no explanation in any submitted document for how a confirmed pathway ceases to exist between one table and the next.

NIS Table 6-2 (p.120) relies exclusively on the 100-metre groundwater Zone of Influence to dismiss all potential adverse effects on every attribute of the Active Raised Bog qualifying interest. The reasoning given in the submitted NIS is simply: the nearest mapped Active Raised Bog is approximately 400 m from construction activities, and since the ZOI has been identified as 100 m, the habitat falls outside it — therefore no potential for adverse effects exists on any

attribute, including habitat area, hydrological regime water levels, and hydrological regime flow patterns.

First there is no map that determines the '400m from construction activities' claim. Scanning the many chapters in EIAR, the AA NIS report finds the following references to the SAC and its relationship to the windfarm development site:

- **SAC boundary: ca. 10m** from the proposed project boundary (NIS, p.117–118)
- **The Sharavogue Bog SAC is within 20 m of the wind farm site boundary**
- **Active Raised Bog habitat [7110*]: 280m** from the project boundary (within the centre of the SAC)
- **Degraded Raised Bog [7120]: ~50m** from the project boundary
- **Table 9-13 (EIAR Ch.9):** quotes **0.1 km** from the wind farm boundary
- **WFD Assessment Table 2-5:** quotes **0.1 km**
- **Nearest active raised bog habitat to construction activity** (e.g. turbine foundation excavations): **~400m** straight-line
- **Nearest active raised bog to dust-generating activities** (e.g. access roads): **~220m**
- The **groundwater Zone of Influence** is defined as 100m; the SAC is acknowledged to fall within this Zoi

A full review of the Site maps and planning drawings still doesn't answer this most fundamental question. As is consistent across this submission no clarity on the most important facts is available. Without this information we are all blind to the real impact. Surely this is unacceptable.

Working with what has been presented, the 100m ZOI figure has no derivation, citation, methodology, or site-specific validation behind it. It is stated as a given and applied directly. No source document, no GSI guidance, no peer-reviewed standard, and no modelling output is cited anywhere in the EIAR or NIS to justify it.

It appears that the Zoi is derived from a bedrock aquifer vulnerability framework. The relevant pathway, confirmed in NIS Table 6-1, operates through the near-surface peat water table — a completely different system governed by shallow, laterally mobile hydrology that responds directly and rapidly to drainage modification. Bedrock aquifer behaviour does not model near-

surface peat water table dynamics. Peat hydraulic conductivity, water table depth, and drainage response characteristics are not captured by bedrock aquifer Zol methodology.

EIAR Chapter 9 (p.9-34) records in the applicant's own text that along the eastern margin of the wind farm site, "fen peat is present and there is upwelling of base rich water that supports carr woodland and calcareous fen vegetation." Calcareous fen is an obligate groundwater-dependent vegetation type that occurs only where base-rich groundwater upwells at or near the surface. This is physical, in-situ evidence of an active near-surface groundwater pathway operating across the interface between the construction zone and the SAC boundary — recorded in the applicant's own EIAR and not referenced anywhere in the NIS integrity assessment.

The applicant presents their own characterisation of the Shinrone Groundwater Body, sourced from GSI (2003a). *"Groundwater flow paths are generally short, on the order of 30-300 m, with groundwater discharging to the streams and rivers that traverse the aquifer."*

The T8/T9 turbine foundations are proposed at 4.5 m depth below ground level. BH02, the nearest borehole, records 2.3 m of peat over a continuous column of very soft silt and clay to 12.8 m, with SPT N=0 throughout — meaning the excavation will penetrate through peat into a saturated, low-resistance substrate in the direct hydraulic gradient toward the SAC boundary and the Little Brosna. The minimum travel distance from those excavations to the SAC boundary sits within the 30–300 m range the applicant's own EIAR applies to this groundwater body.

Under *Holohan* (C-461/17, para.44), this constitutes a gap of the most fundamental kind in the Appropriate Assessment.

6.3.4.2 No review of atmospheric Nitrogen Deposition at Sharavogue Bog SAC

NPWS Conservation Objectives Sharavogue Bog SAC 000585 establishes that atmospheric nitrogen deposition at Sharavogue Bog SAC stands at 13.2 kg N/ha/yr against a conservation objective of 5 kg N/ha/yr, 163% above threshold. The NIS contains no modelling of additional nitrogen loading from construction traffic and machinery over a two-year programme.

In Chapter 10 Air Quality there is a single reference to Sharavogue Bog SAC in the entire chapter. It appears in Section 10.5.2 (Sensitivity of the Receiving Environment), p.10-16, in the context of the IAQM construction dust ecological sensitivity assessment:

"The Sharavogue Bog SAC is within 20 m of the wind farm site boundary and the Woodville Woods pNHA is within 20 m of the proposed GCR, therefore the sensitivity of the area to ecological impacts from construction dust is considered high."

Beyond this single reference there is no attempt to model or estimate the additional nitrogen loading that would arise from two years of construction traffic — HGV movements, diesel plant, concrete pours — passing along routes in the immediate vicinity of a European site already in severe exceedance

- **There is no critical load assessment... The traffic assessment is scoped out**, entirely on the grounds that neither AADT nor HDV AADT will increase by the TII threshold values. The TII PE-ENV-01106 scoping criteria are designed to identify road links requiring detailed dispersion modelling for roadside NO₂ and PM compliance — they are not designed to assess incremental nitrogen deposition to sensitive habitats below those thresholds.
- **The dust mitigation measures are not directed at nitrogen deposition.** Table 10.10 sets out standard construction dust management — water suppression, wheel washing, covered vehicles, visual inspections. These address particulate dust soiling. They do not reduce vehicular NO_x or NH₃ emissions, which are the drivers of atmospheric nitrogen deposition to sensitive habitats. There is no measure in Table 10.10 that would reduce nitrogen loading to the SAC.
- **The residual effects conclusion does not engage with the SAC.** Section 10.8.1 concludes the residual construction phase effect will be "not significant with respect to human health and ecology." That conclusion is reached without any assessment of nitrogen deposition to Sharavogue Bog SAC — the one ecological receptor the chapter itself identifies as a high sensitivity site within 20 m of the works.

Chapter 10 explicitly acknowledges at p.10-16 that Sharavogue Bog SAC is a high-sensitivity ecological receptor within 20 m of the wind farm site boundary. It then assesses only construction dust soiling and deposition against that receptor, using standard IAQM particulate matter guidance. It does not consider the atmospheric nitrogen deposition pathway at all. The conclusion that residual effects on ecology are "not significant" is therefore reached without

assessing the most ecologically relevant atmospheric pathway to the designated receptor that the chapter itself has identified.

6.3.4.3 The physical habitat buffer between the wind farm site and Sharavogue Bog SAC is eliminated without assessment as an adverse effect on site integrity

The SAC boundary is approximately 10 m from the proposed wind farm site (Table 6-1). Between that 10-metre gap and the SAC qualifying interest habitat sits a sequence of transitional habitats that perform a direct physical buffering function. EIAR Chapter 6 Table 6-17 confirms that the following habitats are present in the southern section of the wind farm site adjacent to the SAC and are proposed to be permanently lost:

- **PB4 Cutover Bog — 0.62 ha** permanently lost. Assessed by the developer as Moderate Effect on the basis that it is degraded.
- **WN7 Bog Woodland — 2.82 ha** permanently lost. Assessed as Significant Effect at local scale.
- **WS1 Scrub — 1.06 ha** permanently lost (including areas in the southern section). Assessed as Moderate Effect.

EIAR Chapter 6 also records that WS1 Scrub is described as largely established on areas of PB4 Cutover Bog, with some WS1 transitioning to WN7 Bog Woodland — confirming these three habitats form a continuous successional sequence from cutover bog outward to the SAC boundary.

Three distinct buffering functions are lost:

1. **Surface hydrological buffering.** PB4 Cutover Bog and WN7 Bog Woodland in the southern section retain and moderate surface water flow from the construction zone toward the SAC boundary. They intercept, slow, and filter surface runoff before it reaches the SAC. Their permanent removal exposes the SAC boundary directly to surface drainage from construction hardstanding, including during the 1% AEP flood events that the developer's own FRA confirms affect T8 and T9. The SWMP and CEMP address sediment and water quality in watercourses — they do not replace the physical surface hydrological buffering function of the vegetation being removed.
2. **Ecological connectivity and lagg zone integrity.** The NPWS Conservation Objectives document identifies the eastern lagg zone as the primary element of local distinctiveness at Sharavogue Bog SAC — “one of the best developed lagg systems in the country”. The lagg is supported by base-rich groundwater upwelling along the eastern

margin, which EIAR Chapter 9 (p.9-34) records directly at the interface between the wind farm site and the SAC. The WN7 Bog Woodland and PB4 Cutover Bog in the southern section currently sustain the ecological transition between the mineral-influenced zone of the wind farm site and the lagg. Their permanent removal eliminates the successional mosaic that connects those systems and exposes the lagg microhabitat — including the *Eriophorum gracile* Slender Cottongrass population — to direct edge effects: altered evapotranspiration, increased insolation, wind exposure, and changed drainage gradients.

3. **Dust and particulate buffering.** EIAR Chapter 10 (Section 10.5.2) confirms that Sharavogue Bog SAC is within 20 metres of the wind farm site boundary and that ecological sensitivity to dust is assessed as high. The removal of PB4, WN7, and WS1 from the interface zone eliminates any vegetation screening function for dust and particulate deposition reaching the SAC during construction. This interaction — removal of the dust buffer concurrent with the generation of high-risk dust at 10 metres from the SAC — is not assessed anywhere in the submitted documents.

6.3.4.4 Additional compounding problems recorded in the Applicants documents:

- **Restoration trajectory not assessed.** Sharavogue Bog is in active NPWS-funded restoration: over 400 rewetting dams installed in 2021, 26.4 km of drains blocked, and a formal conservation objective to increase Active Raised Bog from 25.8 ha to 40.9 ha — a target not yet met. The NIS applies distance-based metrics to static habitat maps. It does not assess whether any disruption to the near-surface peat water table could arrest or reverse the post-2021 rewetting trajectory, which is the constitutive process being actively managed at the site.
- **No mitigation exists for the identified pathway.** Because NIS Table 6-2 concludes no adverse effects, no mitigation has been designed for the groundwater pathway to the SAC. The SWMP and CEMP address surface water quality in watercourses, not near-surface groundwater dynamics. No SAC-boundary trigger threshold is defined. No corrective mechanism exists.
- **SWMP irreconcilability at T8/T9.** The developer's own Flood Risk Assessment confirms T8 and T9 are in Flood Zone A/B and liable to fluvial flooding at 1% AEP events, and that access roads cannot be used after heavy rainfall. The SWMP commits to ECoW presence during rainfall events of 15 mm in 6 hours — the same conditions

under which the FRA confirms access is lost. T8 and T9 are the excavations closest to the SAC boundary. These two commitments are irreconcilable.

6.3.5 How the Applicant addresses these deficiencies : NIS – Table 6-2

The Architecture of the Table

Table 6-2 from the NIS is the overarching assessment of Adverse Effects on the Conservation Objectives of the Sharavogue Bog SAC. Across the board the conclusion is nil effect.

Table 6-2: Assessment of Adverse Effects on the Conservation Objectives of the Sharavogue Bog SAC as a Result of the Proposed Project

Attributes	Measures	Target	Potential for Adverse Effects
[7110] Active raised bogs *			
Habitat area	Hectares	Restore area of active raised bog to 40.9ha, subject to natural processes.	No – The nearest mapped location of this QI habitat is approximately 400 m (straight-line distance) from the areas where construction activities with the potential to cause groundwater impacts may occur (e.g. turbine foundation excavations). As the ZiI for such impacts associated with the proposed project has been identified as 100m, there is no potential for adverse effects on this attribute.
Habitat distribution	Occurrence	Restore the distribution and variability of active raised bog across the SAC.	
High bog area	Hectares	No decline in extent of high bog necessary to support the development and maintenance of active raised bog.	The ZiI for potential dust impacts during the construction phase has been identified as 50 m. The nearest mapped location of this QI habitat is approximately 220 m (straight-line distance) from areas where construction activities with the potential to generate dust may occur (e.g. internal access roads). Therefore, there is no potential for adverse effects on this attribute.
Hydrological regime: water levels	Centimetres	Restore appropriate water levels throughout the site.	
Hydrological regime: flow patterns	Flow direction, slope	Restore, where possible, appropriate high bog topography, flow directions and slopes.	On this basis, there is no potential for adverse effects on the attributes of this habitat, and consequently no adverse effects on the integrity of the site.
Transitional areas between high bog and adjacent mineral soils (including cut-over areas)	Hectares; distribution	Restore adequate transitional areas to support / protect the raised bog ecosystem and the services it provides.	
Vegetation quality: central ecotone; active flush/soaks/bog woodland	Hectares	Restore 20.5ha of central ecotone/active flush/soaks/bog woodland as appropriate.	
Vegetation quality: micro-topographical features	Hectares	Restore adequate cover of high quality micro-topographical features	

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Attributes	Measures	Target	Potential for Adverse Effects
Vegetation quality: bog moss (<i>Sphagnum</i>) species	Percentage cover	Restore adequate cover of bog moss (<i>Sphagnum</i>) species to ensure peat forming capacity.	No – Although non-native invasive species were recorded within the site, as no works will be located within the boundary of the SAC and there is no hydrological connection to the SAC, there is no potential for the spread of non-native invasive species.
Typical ARB species: flora	Occurrence	Restore, where appropriate, typical active raised bog flora.	
Typical ARB species: fauna	Occurrence	Restore, where appropriate, typical active raised bog fauna.	No – Change in air quality can result from fertiliser drift, quarry activities, or other atmospheric inputs. In the case of the proposed project, excavation activities and vehicle movement may increase dust generation. However, nitrogen will not be contained in such dust and so not cause
Elements of local distinctiveness	Occurrence	Maintain features of local distinctiveness, subject to natural processes.	
Negative physical indicators	Percentage cover	Negative physical features absent or insignificant.	
Vegetation composition: native negative indicator species	Percentage cover	Native negative indicator species at insignificant levels.	
Vegetation composition: non-native invasive species	Percentage cover	Non-native invasive species at insignificant levels and not more than 1% cover.	
Air quality: nitrogen deposition	kg N/ha/year	Air quality surrounding bog close to natural reference conditions. The total N deposition should not exceed 5kg N/ha/yr.	

The entire Appropriate Assessment for Sharavogue Bog SAC rests on a single block of reasoning. That block is applied once to the [7110] Active Raised Bog attributes and then cascaded to [7120] Degraded Raised Bog and [7150] Rhynchosporion by a single sentence each. It applies one unjustified distance metric — a 100 m groundwater Zone of Influence — to one wrongly selected reference point: 400 m to the interior of the Active Raised Bog, rather than the 10 m SAC boundary or the 20 m lagg zone that the developer's own documents identify.

Active Raised Bog — all twelve attributes are resolved with a single shared block ending: *"On this basis, there is no potential for adverse effects on the attributes of this habitat, and consequently no adverse effects on the integrity of the site."*

[7120] Degraded Raised Bog is resolved: *"there is no potential for adverse effects of degraded raised bogs still capable of natural regeneration habitat, and consequently no adverse effects on the integrity of the site."*

[7150] Depressions on peat substrates of the Rhynchosporion is resolved: *"there is no potential for adverse effects on the attributes of this habitat, and consequently no adverse effects on the integrity of the site."*

This is not a conclusion of "minor effect, manageable by mitigation," not "uncertain, requires monitoring," but a flat finding that no potential for adverse effects exists on any attribute of the only SAC adjacent to the development. That nil conclusion is reached through reasoning that:

- Uses a reference point (400m to the Active Raised Bog interior) that is not the SAC boundary or the ecologically sensitive lagg zone receptor, which the developer's own documents place at 10m and 20m respectively.
- Applies a 100m ZOI that has no derivation, no citation, and is applied to a near-surface peat water table system using bedrock aquifer methodology — the wrong model for the pathway the developer confirmed in Table 6-1.
- States in the invasive species row that "there is no hydrological connection to the SAC" and applies it to all attributes - in the same document where Table 6-1 confirmed "a viable pathway for effect (via physical and hydrogeological connectivity) was identified" and "there is potential for likely significant effects on this SAC."
- Dismisses water quality impacts including lagg zone hydrochemistry with "no pathway to impact on these parameters was identified" — while the developer's own EIAR records base-rich groundwater upwelling at the site boundary feeding calcareous fen vegetation, which is physical evidence of that pathway operating now.

The best example of this tactic is the reference in Table 6.2 to The "Elements of local distinctiveness" - an attribute which shares the same single dismissal block as habitat area, hydrology, water levels, and all other attributes

Elements of local distinctiveness	Occurrence	Maintain features of local distinctiveness, subject to natural processes

The lagg zone is formally identified in the NPWS documentation as the primary element of local distinctiveness at Sharavogue and *Eriophorum gracile* is recorded in the lagg. The table dismisses any potential adverse effect on the "elements of local distinctiveness" attribute using exactly the same 400m/100m Zol reasoning. Yet the lagg is at the boundary, not 400m away.

Similarly the table applies the same dismissal to "*Vegetation quality: central ecotope, active flush, soaks, bog woodland*" and "*Vegetation quality: micro-topographical features.*" The bog woodland (WN7) and scrub being removed from between the site boundary and the SAC have been discussed here but are dismissed in Table 6-2 using the 400m/100m Zol — without acknowledging that 2.82 ha of WN7 Bog Woodland immediately adjacent to the SAC boundary is being permanently removed from the transitional zone.

Further, the "Hydrological regime: water levels" and "Hydrological regime: flow patterns" are both dismissed under the same single block. These are the attributes most directly threatened by any near-surface groundwater disturbance, and the NPWS Conservation Objectives set specific centimetre-level water table requirements for these. The table dismisses both using the 400m/100m reasoning. the hydrological regime attributes — the ones with the most specific quantitative conservation targets — are dismissed on a distance metric that is applied to the wrong reference point.

The developer's conclusion is total. There is no attribute across any qualifying interest where any potential for adverse effect is acknowledged. The word "No" appears as the operative answer to every row. This demonstrates that a single flawed analytical block written once, applying a single unjustified distance metric to a single wrongly selected reference point, dismisses all potential adverse effects on all three qualifying interests of a Priority Habitat SAC in active State-funded restoration — without any SAC-specific survey, any measurement at the

receptor end of the confirmed pathway, any nitrogen modelling, any assessment of the restoration trajectory, and any engagement with the calcareous fen evidence at the boundary.

6.3.6 Mitigation Assessment

Because NIS Table 6-2 concludes no potential for adverse effects, no mitigation has been designed for the protection or preservation of the SAC:

- **No groundwater monitoring is directed at the SAC.** The groundwater monitoring programme described in EIAR Chapter 9 and carried forward into Chapter 20 targets the Ballyloughane public water supply boreholes. No piezometer is proposed at or near the SAC boundary. No SAC water table trigger threshold is defined anywhere in any submitted document. The monitoring column in the Chapter 20 mitigation table for groundwater reads only "existing monitoring boreholes" — all of which are within the wind farm site boundary, not at the receptor end of the confirmed pathway.
- **The SWMP and CEMP are not directed at the SAC.** The Chapter 20 mitigation measures addressing surface water (MM3, MM60, and associated measures) concern erosion and sediment control, settlement ponds, silt fencing, and surface water quality in watercourses. They are designed to protect the Little Brosna_040 water quality. None is formulated to protect the near-surface peat water table that constitutes the confirmed pathway to Sharavogue Bog SAC.
- **No SAC-specific corrective mechanism exists .** We know the SWMP will fail under the foreseeable flood regime at T8 and T9 when under flood conditions swales are submerged, settlement ponds reverse, and ECoW access to site is lost. T8 and T9 are the excavation locations closest to the SAC boundary. There is no contingency protocol in Chapter 20, the CEMP, or the SWMP that would trigger intervention if near-surface groundwater conditions at the SAC boundary were disturbed. There is no threshold, no alarm level, no defined response.
- Finally because no atmospheric Nitrogen Deposition review was conducted no mitigation measures are proposed to protect Sharavogue Bog SAC

6.3.7 Grounds for Objection

Ground 1 — The NIS contains an irreconcilable internal contradiction between Tables 6-1

and 6-2 NIS Table 6-1 (p.118) records in unequivocal terms that a viable hydrogeological pathway exists and that there is "potential for likely significant effects on this SAC." NIS Table 6-2 (p.120) dismisses all potential adverse effects on every qualifying interest attribute without any intervening engineering change, mitigation measure, or new hydrogeological analysis. No

explanation is provided for why a confirmed pathway disappears between one table and the next. *Holohan* (C-461/17, para.44): no lacunae; complete, precise and definitive findings. A pathway confirmed in one table dismissed without explanation in the next is a lacuna of the most fundamental kind. *Waddenzee* (C-127/02): the competent authority cannot ascertain no adverse effect where the developer's own NIS acknowledges potential likely significant effects without resolving them.

Ground 2 — The “400m from Construction activities” is not verifiable. No detail exists on any drawing across the full submission. The NIS itself (Table 6-1, p.117–118) records that the SAC boundary is located at its nearest **10m** from the project boundary, and that the SAC falls within the Zone of Influence for potential groundwater impacts. The nearest ecologically sensitive receptor is the SAC boundary and lagg zone. *Holohan* (C-461/17, para. 44): An Appropriate Assessment must be based on the best scientific knowledge and must be complete, precise and definitive. A distance figure that is unexplained in its derivation, measured to a self-selected reference point rather than the nearest sensitive receptor, and never verified by field measurement at any location between the excavations and the SAC, does not meet this standard. The absence of any explanation of methodology means the figure cannot be independently scrutinised or verified, which is itself a failure of the precision and definitiveness requirements.

Ground 3 - 100-metre groundwater Zone of Influence is unjustified, unexplained, and applied to the wrong hydrogeological model No derivation, citation, methodology, or site-specific validation for the 100-metre Zone of Influence figure is provided anywhere in any submitted document. It is applied using bedrock aquifer vulnerability assessment — the wrong model for a near-surface peat water table pathway. EIAR Chapter 9 (p.9-29) records groundwater flow path distances in the Shinrone Groundwater Body of 30–300 m — a range within which the T8/T9 excavations sit relative to the SAC boundary. *Holohan* (C-461/17, para.44): the assessment must be free of gaps. An assessment resting on an unjustified Zone of Influence figure applied to the wrong hydrogeological model contains a gap where the analysis of the most important pathway should be. NPWS Scoping Response: specific requirement to assess hydrogeological connectivity, including precise water table parameters.

Ground 4 — No investigation was conducted at or near the SAC boundary — the receptor end of the confirmed pathway was not characterised : All groundwater monitoring was confined within the wind farm site boundary. No piezometric data exists for the SAC lagg zone or transitional interface zone. The 100-metre Zone of Influence — the figure that determines

the entire SAC integrity assessment — was applied as a desktop assumption without site-specific measurement at any location between the proposed excavations and the SAC boundary.

Ground 5 — Physical evidence of near-surface groundwater connectivity at the SAC boundary was recorded in EIAR Chapter 9 and not engaged with in the NIS

EIAR Chapter 9 (p.9-34) records calcareous fen vegetation — an obligate groundwater-dependent community occurring only where base-rich groundwater upwells at or near the surface — at the interface between the wind farm site and the SAC. This is physical evidence, in the developer's own submitted documents, of active near-surface groundwater connectivity at the boundary zone. The same paragraph then concludes "there is no hydrogeological connection to the Sharavogue Bog SAC" — a conclusion the calcareous fen evidence directly contradicts. This evidence is not referenced anywhere in the NIS. Holohan (C-461/17, para.44): no lacunae. Physical evidence of the pathway was in the developer's own submission. Its absence from the NIS renders the assessment incomplete. Waddenzee (C-127/02): adverse effects cannot be excluded where the developer has recorded evidence of connectivity and ignored it.

Ground 6 — The NIS assessed a site in active ecological restoration as a static receptor — the risk to the restoration trajectory is not addressed: Sharavogue Bog SAC is in active State-funded restoration: over 400 rewetting dams installed in 2021, 90% of requisite drains blocked. The conservation objective requires restoration of Active Raised Bog from 25.8 ha to 40.9 ha — a target that remains unmet. The NIS integrity assessment applies distance-based metrics to mapped habitat polygons. It does not assess whether construction activities on the adjacent site could disrupt the near-surface groundwater system driving the rewetting trajectory, or whether any such disruption could arrest recovery before the restoration target is achieved. Sweetman (C-258/11, para.48): a project adversely affects site integrity if it prevents lasting preservation of the constitutive characteristics of the site. The restoration trajectory is the constitutive process being actively managed. Any risk of arresting that trajectory constitutes a potential adverse effect. The NPWS Conservation Objectives set specific hydrological parameters that the assessment must protect.

Ground 7 - The physical habitat buffer between the wind farm site and Sharavogue Bog SAC is eliminated without assessment as an adverse effect on site integrity This raises real concerns around 3 critical buffering functions played by that habitat in protection and preservation of the SAC . The habitat acts as a surface hydrological buffering zone, it supports and protects current ecological connectivity and lagg zone integrity and may act as a dust and

particulate buffer especially in the context of heavy scale construction in very close proximity to the SAC. No assessment and no mitigation proposed.

Ground 8 - No review of atmospheric Nitrogen Deposition at Sharavogue Bog SAC Chapter 10 explicitly acknowledges that Sharavogue Bog SAC is a high-sensitivity ecological receptor within 20 m of the wind farm site boundary. It does not consider the atmospheric nitrogen deposition pathway at all. Current atmospheric nitrogen deposition at Sharavogue Bog SAC is approximately 13.2 kg N/ha/yr against a conservation objective target of 5 kg N/ha/yr so Nitrogen deposition is already 163% above the conservation objective target. The NIS integrity assessment contains no modelling of additional atmospheric nitrogen loading from construction traffic, HGV movements, and plant operations across a two-year construction programme. In a system already exceeding its critical load by 163%, no additional increment can be treated as de minimis without modelling demonstrating it is below the margin of detection. Holohan (C-461/17, para.44): the assessment must be complete. Sweetman (C-258/11, para.48): adverse effect includes any disruption to constitutive characteristics — nitrogen deposition is a named attribute of the conservation objectives. Any increment above an already-exceeded threshold is a potential adverse effect that requires quantification. The conclusion that residual effects on ecology are "not significant" is therefore reached without assessing the most ecologically relevant atmospheric pathway to the designated receptor that the chapter itself has identified. No mitigation measures proposed.

Ground 9 — No mitigation has been designed for the identified hydrogeological pathway to the SAC Because NIS Table 6-2 concludes no potential for adverse effects, no mitigation is proposed for Sharavogue Bog SAC. The SWMP and CEMP address surface water quality in watercourses — not the near-surface groundwater pathway confirmed in Table 6-1. Groundwater monitoring targets public water supply boreholes, not SAC water table levels. No SAC-boundary trigger threshold is defined. No corrective mechanism exists. People Over Wind (C-323/17, 2018): mitigation must be assessed in full before consent. NPWS Scoping Response: "it is not appropriate for the details of proposed mitigation measures to be agreed post consent." The absence of any mitigation for the identified pathway means there is nothing to assess — the no-adverse-effect conclusion cannot be based on mitigation that does not exist.

Ground 10 — The SWMP fails under foreseeable flood conditions at the most sensitive locations The developer's own FRA (Appendix 9-3, p.23) confirms that T1, T2, T8 and T9, and sections of site access roads, are liable to fluvial flooding during 1% AEP events, and that

access roads must not be used after heavy rainfall. The SWMP commits to ECoW presence during major rainfall of 15 mm in 6 hours. These commitments are irreconcilable: the conditions requiring ECoW presence are the same conditions under which access is lost. T8 and T9 — adjacent to the SAC boundary and with the deepest excavations — are among the flood-affected locations. People Over Wind (C-323/17, 2018): mitigation must be assessed in full. The SWMP fails against the developer's own flood data. A no-adverse-effect conclusion resting on surface water mitigation that fails under foreseeable site conditions does not satisfy Article 6(3).

6.3.8 Conclusion — KER 2 Sharavogue Bog SAC

The developer's own NIS confirmed a viable hydrogeological pathway to a priority habitat SAC in active State-funded restoration — and then dismissed it without explanation, on the basis of an unjustified Zone of Influence figure applied to the wrong hydrogeological model, while ignoring physical evidence of groundwater connectivity recorded in its own EIAR, without any measurement at the receptor end of the pathway, and without designing any mitigation for the pathway it had confirmed. The SWMP, which is the only surface water protection in the application, fails under the flood regime confirmed for the most sensitive construction locations. With both derogation pathways waived, refusal is the only lawful outcome on KER 2 as submitted.

6.4 KER 3 — Aquatic Ecology

Species covered: Atlantic Salmon (*Salmo salar*) · Brown Trout (*Salmo trutta*) including the Croneen sub-population · River Lamprey (*Lampetra fluviatilis*) · Brook Lamprey (*Lampetra planeri*) · Sea Lamprey (*Petromyzon marinus*) · European Eel (*Anguilla anguilla*) · White-clawed Crayfish (*Austropotamobius pallipes*).

6.4.1 What Was Required

Inland Fisheries Ireland submitted a detailed scoping input to the developer. That input is summarised in EIAR Chapter 6, Table 6-1 (p.6-6) and replicated in NIS Table 2-2. It required the following specific deliverables:

- Detailed assessments of all watercourses affected by construction.
- Aquatic biodiversity surveys.
- Electrofishing surveys to identify sensitive species.
- Soil stability assessment and expert evaluation to prevent landslides.
- Hydrology and drainage management during construction and operation to avoid erosion and pollution.
- Risks of sediment release from road construction specifically highlighted.
- Proper waste and pollutant containment.
- Careful planning of all watercourse crossings — with consultation with IFI on crossing designs.

The NPWS scoping response required all watercourses within the development area to be surveyed for Annex II and Annex IV species, explicitly naming salmon, lamprey species, and white-clawed crayfish.

6.4.2 Legal Status

Atlantic Salmon and lamprey species are listed on Annex II of the Habitats Directive and require designation of SACs. European Eel is Critically Endangered on the IUCN Red List. White-clawed Crayfish is listed on Annex II and Annex V. The Croneen population of Brown Trout has been identified by the Wild Trout Trust and Inland Fisheries Ireland as a genetically distinct sub-population of national conservation significance.

6.4.3 The WFD Baseline

The Little Brosna_040 River Waterbody runs along the eastern boundary of the proposed wind farm site and receives all nine turbine drainage areas. Its WFD ecological status for 2019–2024 is Poor, at Risk of not achieving Good status by 2027. Appendix 6-3 records Site 11 on the Pallas Kylenamuck tributary (joining the Little Brosna 25 m from the survey point) as Bad status, Seriously Polluted.

EIAR Chapter 9 Table 9-5 presents all tributaries in the Little Brosna_SC_020 sub-catchment as having Moderate WFD status. The entire Chapter 9 impact assessment and all SWMP adequacy conclusions are built on this Moderate baseline. Appendix 9-1 (WFD Assessment) Table 2-2 correctly records the Little Brosna_040 RWB as having deteriorated to Poor status for 2019–2024. Appendix 9-1 explicitly delegates its WFD compliance conclusions back to Chapter 9. The WFD compliance assessment for all aquatic species is therefore built on a Moderate baseline for a waterbody at Poor status. No assessment of whether construction-phase impacts would cause deterioration from Poor has been conducted.

6.4.4 Survey Effort

All aquatic surveys were conducted in summer base-flow conditions (August 2022, June 2023, July 2024). Atlantic Salmon return migration and spawning (October–January), Sea Lamprey migration and spawning (spring), and Silver Eel downstream migration (autumn) fall entirely outside the survey period. The main Little Brosna_040 channel — the migration corridor — was accessible for electrofishing at one site only.

Species	Critical Period	Surveyed?	Assessment?
Atlantic Salmon (Annex II)	Migration & spawning: October – January	No	None (summer absence cited as justification)
River Lamprey (Annex II)	Upstream migration: autumn/winter	No	Not seasonally assessed
Sea Lamprey	Upstream migration: April – June	No	Not seasonally assessed
European Eel (Crit. Endangered)	Downstream migration: September – November	No	No targeted survey conducted
Brown Trout (Annex V)	Spawning: October – January	Partial (summer only)	No spawning season assessment

This timing failure is not merely an oversight. The survey report lists every one of these species as a species of conservation concern at Section 4 in Appendix 6-3, pp.34-39, and acknowledges their seasonal biology. Yet every conclusion about their absence or limited significance is drawn from surveys conducted outside their critical ecological windows. The report does not acknowledge this disconnect. The conclusion that Atlantic Salmon are not significantly affected by construction because none were found during July electrofishing is not a scientific inference — it is a conclusion predetermined by the choice of survey date.

Five electrofishing sites (Sites 4, 6, 7, 8, 9) cover the tributary network within the wind farm boundary. The main Little Brosna_040 channel — the primary migration corridor for all diadromous species — was electrofished at Site 1 only, which is located downstream of the wind farm boundary (Appendix 6-3, Section 2.2.7, p.12). No electrofishing was carried out within the main channel section adjacent to T8 and T9 — the section most directly at risk from construction-phase sedimentation. This was not a consequence of physical inaccessibility: the main channel was accessible and was surveyed at Site 1. It was a survey design choice that left the most critical corridor section without any baseline biological data

White-clawed crayfish were assessed by daytime visual and hand search — the lowest-sensitivity method for a predominantly nocturnal species. No night-time torchlight survey and no systematic refuge-lifting survey was conducted. NBDC records two White-clawed Crayfish at a site 4 km downstream on the same waterbody (2021). The conclusion of absence is based on a survey method inadequate for reliable detection of a nocturnal species with recent nearby records.

6.4.5 Species-by-Species Analysis

6.4.5.1 Atlantic Salmon (*Salmo salar*) — Annex II, Habitats Directive

Atlantic Salmon is an Annex II species requiring designation of SACs for its habitat. It undertakes return migration and spawning between October and January — the high-flow, high-flood-risk season.

No Atlantic Salmon were recorded at any of the six electrofishing sites. The developer attributes this to channel modification, agricultural and forestry influences, and limited suitable

nursery and spawning habitat (Appendix 6-3, Section 4.1, p.35). The assessment acknowledges the species' Annex II status and assigns it Local Importance (Higher value) with downstream effects considered (Appendix 6-3, p.35). The final conclusion in EIAR Section 6.6 is that, with SWMP mitigation in place, residual impacts on salmon will not be significant.

The summer base-flow survey window (July 2024) has virtually no probability of detecting migratory adults passing through the system. Atlantic Salmon return to freshwater between October and January — the period of highest runoff and greatest construction-sediment mobilisation risk on this site. The main Little Brosna_040 main channel, acknowledged as the likely migration corridor (Appendix 6-3, Section 4.1, p.35), was sampled at one site only, downstream of the wind farm boundary (Site 1, Appendix 6-3, Table B-2, p.42). The channel sections adjacent to T8 and T9 — the locations where SWMP failure under flood conditions is confirmed by the FRA — received no electrofishing effort.

The FRA (Appendix 9-3, p.11) confirms T9 is 50% inundated at the 1-in-100-year event and rises to 75% under the MRFS climate scenario. Under these flood conditions, settlement ponds in the T8/T9 corridor are submerged and reversed. Accumulated construction sediment is discharged directly into the Little Brosna at peak flood flow — precisely when Atlantic Salmon are migrating and spawning. No assessment of this interaction exists in any submitted document. The no-adverse-effect conclusion for Atlantic Salmon cannot stand.

6.4.5.2 Brown Trout (*Salmo trutta*) — Annex V, and the Croneen Sub-Population

Brown Trout is listed on Annex V of the Habitats Directive. In this catchment a genetically distinct sub-population in the Croneen tributary carries additional significance.

6.4.5.2.1 *The Croneen Population and Why It Matters See Appendix 6-1, Appendix 6-2*

The Croneen is a tributary of the Little Brosna River, within the Little Brosna_040 River Waterbody — the primary aquatic receptor for all nine turbine drainage areas in the proposed development. Its brown trout population has been identified through genetic analysis as a distinct sub-population, separate from the general Little Brosna stock, and designated by Inland Fisheries Ireland as a specific survey reach within the National Electrofishing Programme (NFEP), with its own fish stock dataset and priority management status. Brown Trout is listed on Annex V of the Habitats Directive. A genetically distinct sub-population is an

irreplaceable genetic lineage: if it is lost, it cannot be reconstituted from the general catchment stock.

This population is not obscure. It is documented in each of the following sources, all of which were available to the developer before the survey programme was designed:

Source	Status and relevance
IFI Little Brosna Catchment Factsheet (2021) See Appendix 6-1	Freely accessible via the IFI website. Identifies the Croneen as a specific NFEP reach and the brown trout population as a distinct management priority.
IFI National Electrofishing Programme records	Held by IFI; routinely disclosed in response to pre-application data requests. The Croneen is a designated NFEP reach with its own longitudinal dataset.
IFI scoping input (NIS Table 6-1)	Required the developer to identify sensitive aquatic species. Raised specific concerns about the Little Brosna and its tributaries. The Croneen is a named IFI management tributary in this catchment.
NPWS scoping response	Directed the developer to consult IFI on fish species impacts — specifically to obtain catchment-level data before finalising the survey design.

6.4.5.2.2 An inadequate desktop review

The desktop review in Appendix 6-3 does not reference the IFI catchment factsheet series, the NFEP dataset for the Croneen reach, or any IFI-held catchment-level fish stock data beyond generalised WFD status records. The word "Croneen" does not appear in EIAR Chapter 6, Appendix 6-3, or the NIS. This is not a species that requires specialist detection to locate, it is documented in freely accessible, statutory-body publications that any competent aquatic ecology desk study for this catchment would consult as a first step.

The same failure is visible across the aquatic KER: the wrong WFD baseline was used for the primary receiving waterbody; European Eel confirmed in the IFI factsheet received no targeted survey; White-clawed Crayfish with downstream NBDC records were assessed using a daytime method inadequate for a nocturnal species. In each case the data was accessible and was not acted upon. The Croneen is the most unambiguous example because the IFI's own documentation names both the tributary and the population explicitly.

Because the Croneen population was not identified in the baseline, every subsequent stage of the assessment fails for this receptor:

- No electrofishing site was placed on the Croneen. The population's current status — size, age structure, recruitment success — is entirely unknown.
- The southern site — T8, T9, borrow pits, and access tracks — drains into the tributary network feeding the Croneen corridor. Construction-phase sedimentation reaching this network was never assessed against this population.
- No mitigation measures were designed for the Croneen. IFI Guidelines (2016), required by the IFI scoping input, mandate specific protection for sensitive fish populations. None was provided.
- The NIS treats all brown trout in the catchment as equivalent. The distinction between the genetically generic Little Brosna stock and the irreplaceable Croneen sub-population is never drawn.

Under the SWMP failure mode at T8/T9 under flood conditions, construction sediment can reach the Croneen network without interception. The genetic distinctiveness of this sub-population means that a significant mortality event cannot be compensated by recolonisation from the general Little Brosna stock.

The Wild Trout Trust, a UK registered conservation charity with direct prior experience of the River Shannon system including the Little Brosna, has submitted a letter of concern regarding the Ballincor development. See Appendix 6-2. Its key points are:

- The Little Brosna supports a distinct, locally adapted trout population — the Croneen Trout — whose genetics and population structuring have been the subject of dedicated study by Queen's University Belfast and citizen scientists, underlining its conservation

importance. The catchment also holds Atlantic salmon, now internationally designated as endangered.

- The Trust identifies fine sediment escapement — both during construction and subsequent operation — as the recurring mechanism by which wind farm developments degrade water quality and spawning substrate, harming fish and invertebrate populations. It attributes this to poor site selection, inadequate screening, and poor management.
- It cites a track record of catastrophic failures at comparable Irish and British developments — Derrybrien (Co. Galway), Tullynamoyle (Co. Leitrim), Meenbog (Co. Donegal), and Viking Wind Farm (Shetland) — where bog slides and sediment runoff to watercourses were a common theme.
- It notes that the impact of shadow flicker on fish and other wildlife at watercourse-adjacent developments of this type remains unquantified and should be assessed.
- While recognising the need for renewable energy, the Trust holds that energy can only be considered "green" if obtained without environmental detriment and concludes that an industry with such a poor track record poses serious cause for concern when sited this close to a watercourse supporting locally unique and internationally endangered fish.

6.4.5.3 Lamprey Species — River Lamprey (Annex II), Brook Lamprey (Annex II), Sea Lamprey

Two lamprey ammocoetes (larval stage) were captured at Site 7 (Holy Well Clohaskin, EPA code 25H28) during the July 2024 electrofishing survey, measuring 7cm and 14cm. They could not be differentiated to species level on site (Appendix 6-3, Table B-3, p.43; p.24). Appendix 6-3 records these at Table B-3 as 'Brook lamprey' (Fish IDs 25H28_a_00004 and 25H28_a_00005), though the text notes the difficulty of on-site differentiation. Four lamprey ammocoete burial areas were identified within the study area at Sites 1, 6, 7, and 9 (Appendix 6-3, p.24). Suitable silt habitat for larval lamprey was recorded throughout the main Little Brosna_040 channel. Sea Lamprey was not recorded.

The deficiencies for lamprey mirror those for Atlantic Salmon. River Lamprey undertakes its upstream spawning migration in autumn and winter — entirely outside the July survey window. Sea Lamprey migrates upstream in spring. No survey effort was directed at the main migration

corridor during either period. The low recruitment evident from the survey — only two ammocoetes across three suitable sites — may reflect barriers to upstream migration, poor spawning grounds, or unsuitable silt conditions, any of which are potential construction-impact pathways that have not been assessed seasonally.

The development proposes 14 drain crossings using culverts within the wind farm boundary (EIAR Chapter 9, Table 9-14, p.9-40). No assessment of any culvert design against the migration requirements of lamprey has been conducted in any submitted document. No fish pass is proposed at any crossing. IFI specifically required 'careful planning of watercourse crossings' — this requirement is acknowledged in EIAR Table 6-1 but is not implemented. For the Holy Well Clohaskin main channel crossing between T2 and T3, a clear-span bridge avoids in-stream works. However, the 14 drainage ditch culverts receive no individual passage analysis whatsoever.

6.4.5.4 European Eel (*Anguilla anguilla*) — Critically Endangered, EC Recovery Regulation

No targeted eel survey was conducted. The assessment comprises a habitat suitability evaluation only (Appendix 6-3, Section 4.2, pp.36-37). No electrofishing site yielded European Eel. The developer notes that the main Little Brosna_040 channel 'likely serves more as a migratory pathway for European Eel than as a foraging or nursery habitat, and that even small channels with limited overall fisheries value can function as eel migratory pathways' (Appendix 6-3, p.37). All watercourses in the study area are assessed as having the potential to support European Eel.

Having acknowledged that European Eel almost certainly uses every watercourse in the study area as a migration pathway, the assessment provides no survey data for the species, no assessment of whether the proposed 14 drainage culvert crossings obstruct eel passage, and no mitigation specific to eel. European Eel receives no assessment in the NIS and no specific mitigation anywhere in the submitted application. The Silver Eel (adult, seaward-migrating phase) undertakes its downstream migration typically from September/October onwards — entirely outside the July survey window. This is also the onset of the flood season.

Given the species' Critically Endangered status and its independent legal protection under Council Regulation (EC) No. 1100/2007, the complete absence of targeted survey data, passage assessment, and mitigation is an unambiguous and serious gap. It is all the more

troubling that the developer simultaneously acknowledges the species uses every watercourse on the site and then fails to assess any of those watercourses for eel passage under the proposed culvert designs.

6.4.5.5 White-clawed Crayfish (*Austropotamobius pallipes*) — Annex II and Annex V

Sites 1, 4, and 10 were identified as having potential crayfish habitat during the surveys. The assessment method used was daytime visual inspection and hand search at each site (Appendix 6-3, Section 2.2.9, p.13). No crayfish were recorded. The developer concludes at Appendix 6-3, Section 4.3.2 (p.34) that 'the streams located within the proposed project did not have potential habitat for white-clawed crayfish' and that crayfish 'have not been recorded in any of the watercourses within or downstream of the proposed project.'

The statement that crayfish have not been recorded 'within or downstream' of the proposed project is factually incorrect on the face of the developer's own supporting data. The National Biodiversity Data Centre (NBDC) records two White-clawed Crayfish observations from 2021 on the Little Brosna waterbody, approximately 4km downstream of the development site on the same connected waterbody. These records are referenced in Appendix 6-3 (Section 3.2.3.4, p.16, Site 1) but then characterised as 'not expected to occur' within the project area. The leap from 'not found during a daytime visual search' to 'not expected to occur' is not a scientific conclusion — it is a consequence of an inappropriate survey method.

White-clawed Crayfish is predominantly nocturnal and is most effectively detected by night-time torchlight survey combined with systematic lifting of submerged refuges. No night-time torchlight survey was conducted. No systematic refuge-lifting protocol was followed. The method referenced is Peay (2002) — the standard protocol — but the field effort described in Appendix 6-3 does not meet that protocol's requirements for a nocturnal species. The conclusion of absence cannot be treated as equivalent to a reliable absence determination for an Annex II species with recent downstream records on the same connected waterbody. Under Holohan (C-461/17), the assessment of an Annex II species must be complete and precise.

6.4.5.6 Alpine Newt (*Ichthyosaura alpestris*) — Invasive Non-Native Species

Alpine Newt eDNA was detected at four of the five eDNA sampling sites: Sites 12 (bog drain), 7 and 6 (Holy Well Clohaskin), and 8 (Pallas 25). Only Site 3 returned a negative result (Appendix 6-3, Section 4.4, p.38). Alpine Newt is listed under the Third Schedule of S.I. 477/2011 as an invasive non-native species. It carries the disease chytridiomycosis, which can cause significant harm to native amphibian populations.

The developer acknowledges the biosecurity risks and commits to biosecurity protocols. However, the extent of eDNA-positive detections — four of five sites, including multiple watercourses within the development footprint — means that any in-stream or near-stream construction work carries a risk of further spread. The CEMP (Appendix 23) commits to biosecurity measures but these are framework commitments to be developed post-consent. Under People Over Wind (C-323/17), mitigation must be assessed in full before consent, not deferred to contractor method statements.

6.4.6 Grounds for Objection

Ground 1 — The aquatic species impact assessment was conducted against the wrong WFD baseline — Moderate instead of Poor EIAR Chapter 9 Table 9-5 presents the Little Brosna sub-catchment tributaries as Moderate WFD status. All Chapter 9 impact assessment conclusions, and the SWMP adequacy conclusions, use this Moderate baseline. Appendix 9-1 Table 2-2 correctly records the Little Brosna_040 RWB — which receives all nine turbine drainage areas — as Poor status, At Risk of not achieving Good by 2027. Appendix 9-1 explicitly delegates its WFD compliance conclusions back to Chapter 9. The entire WFD compliance assessment for aquatic species is built on the wrong status class. **Legal standard:** Weser (C-461/13, 2015): the WFD non-deterioration obligation prohibits any deterioration in waterbody status class. For a waterbody at Poor status, any further deterioration — even marginal — is a WFD breach. No assessment of whether construction-phase impacts would cause deterioration from Poor has been made. Holohan (C-461/17, para.44): a WFD compliance assessment built on the wrong baseline is not complete.

Ground 2 — All aquatic surveys were conducted in summer base-flow conditions No assessment of migratory salmonid and eel passage during the migration and spawning seasons: Atlantic Salmon return migration and spawning (October–January), Sea Lamprey migration and spawning (spring), and Silver Eel downstream migration (autumn) all fall outside the survey period. The main Little Brosna_040 — the migration corridor — was accessible for electrofishing at one site only. No assessment of construction-phase impacts on migratory species during migration seasons was conducted. These are also the high-flow seasons when

SWMP failure is most probable. NPWS Scoping: surveys must identify all sensitive species present. IFI Scoping: identification of sensitive aquatic species was specifically required. Holohan (C-461/17, para.44): the assessment must be complete.

Ground 3 — Failure to identify a sensitive aquatic species, Croneen Trout and unassessed construction-phase impact on the Croneen sub-population from southern site drainage:

The IFI scoping input required the developer to identify sensitive aquatic species in the catchment. The NPWS scoping response directed consultation with IFI on fish species impacts. The IFI Little Brosna Catchment Factsheet (2021) — freely available via the IFI website — identifies the Croneen as a priority management reach containing a genetically distinct brown trout sub-population. No reference to the Croneen, its fish stock data, or its population significance appears anywhere in the submitted application. No mitigation presented.

Ground 4 — White-clawed crayfish were assessed using a method with low detection probability — the conclusion of absence is unreliable:

Two NBDC records of White-clawed Crayfish exist 4 km downstream on the same waterbody (2021). Sites 1, 4, and 10 were recorded as having potential crayfish habitat. The survey method — daytime visual and hand search — is the lowest-sensitivity method for a predominantly nocturnal species. No night-time torchlight survey was conducted. No systematic refuge-lifting survey was conducted. On the basis of this survey the developer concludes crayfish are not expected to occur, and the species receives no NIS assessment and no mitigation. NPWS Scoping requires watercourses to be surveyed for Annex II species using appropriate methods. An Annex II species with confirmed nearby records, excluded from further assessment on the basis of a survey with low detection probability, represents a gap under Holohan. If crayfish are present and undetected, there is no mitigation for a species acutely vulnerable to sedimentation.

Ground 5 — The SWMP fails under flood conditions at T8 and T9 — highest sediment release coincides with migration and spawning seasons:

The FRA confirms T9 has a 50% probability of fluvial inundation at 1% AEP, rising to 75% under the climate change scenario. T8 has 5% inundation probability at 1% AEP. Under flood conditions the SWMP settlement pond system is reversed and accumulated construction sediment is discharged directly to the Little Brosna at peak flow. The highest sediment release risk coincides with autumn/winter — the migration and spawning seasons for Atlantic Salmon, Brown Trout, Lamprey, and European Eel. People Over Wind (C-323/17, 2018): mitigation must be assessed in full. A no-adverse-effect conclusion for Annex II aquatic species resting on mitigation that fails under foreseeable site conditions does not satisfy Article 6(3). Weser (C-461/13): for a waterbody already at Poor

status, any flood-condition sediment pulse from construction areas would represent further deterioration.

Ground 6 — No fish pass or eel pass provision at 14 drain crossings — potential migration

barriers not assessed: The proposed development includes 14 drain crossings using culverts. No assessment of culvert design against migration requirements for lamprey, eel, or Brown Trout is included in any submitted document. No fish pass or eel pass provision is proposed. IFI specifically required careful design of watercourse crossings; that requirement is acknowledged in the submitted documents but not implemented. IFI Scoping: careful design of watercourse crossings was specifically required. Holohan (C-461/17, para.44): the assessment must be complete. For Annex II lamprey species confirmed at Site 7 on the Holy Well Clohaskey — which involves one of the proposed crossings — the absence of any passage assessment is a lacuna in the integrity assessment.

6.4.7 Conclusion — KER 4 Aquatic Ecology

The aquatic species assessment was conducted against the wrong WFD baseline for the primary receiving waterbody; excluded the migration and spawning seasons of the migratory species it purported to assess; omitted the most ecologically sensitive sub-population in the catchment; concluded absence of an Annex II species using a detection method inadequate for that species; relies on surface water mitigation that fails at peak flood conditions coinciding with peak ecological sensitivity; and proposes 14 infrastructure crossings without fish passage assessment. These are individually and cumulatively fatal to the no-adverse-effect conclusion.

6.5 KER 4 — BATS

6.5.1 Legal Status

All Irish bat species are listed on Annex IV of the Habitats Directive and subject to strict protection under Article 12 (transposed by Regulation 51 of S.I. No. 477 of 2011). The Wildlife Act 1976 (as amended) independently prohibits intentional disturbance, injury, or killing of any bat or interference with roosting places. Lesser Horseshoe Bat carries additional Annex II protection. A grant of planning permission does not constitute, and cannot substitute for, the required derogation licence.

The key legal principles governing this assessment are:

- **Article 12 strict protection** applies wherever Annex IV species are found — not only within European site boundaries. It prohibits deliberate capture or killing, deliberate disturbance during breeding, rearing, hibernation and migration, and deterioration or destruction of roosting sites.
- **The Drumakilla line of authority** (Namur-Est Environnement C-463/20; Hellfire Massy C-166/22; AG Opinion in Drumakilla C-58/24, September 2025) clarifies the interaction between the Article 12 prohibition and planning consent. Where a developer accepts that bat mortality from turbine operation is likely, this constitutes deliberate killing since the developer accepts the possibility of such killing. Because the deliberate killing of individual specimens is prohibited under Article 12, such a development entails a significant environmental effect. A derogation decision must form part of the development consent procedure. A planning authority cannot grant permission until a valid derogation licence is obtained, with supporting information published to allow public participation.
- **Hellfire Massey** (ECLI:EU:C:2023:545) — cited by name in the NPWS scoping response for this application — establishes that any Regulation 54 derogation must be secured before the grant of planning permission. **People Over Wind** (C-323/17) requires that mitigation measures be assessed in full within the Appropriate Assessment, not assumed to work. **Holohan** (C-461/17) requires complete, precise and definitive findings free of lacunae. **Waddenzee** (C-127/02) requires the competent authority to ascertain beyond reasonable scientific doubt that consent will not adversely affect protected interests.
- **The National Biodiversity Action Plan 2023–2030** sets out Government policy on nature conservation. Objective 1 requires all public authorities to move towards no net loss of biodiversity.

- **The Wildlife (Amendment) Act 2023** introduced a statutory public sector duty on biodiversity, requiring every public body to have regard to the Plan's objectives and targets.

The developer has expressly waived both Article 6(4) of the Habitats Directive and Article 4.7 of the Water Framework Directive derogation pathways. If adverse effects on Annex IV bat species cannot be excluded, there is no fallback available. Refusal is the only lawful outcome.

6.5.2 What Was Required

The NPWS Development Applications Unit scoping response set the following bat-specific requirements:

- Detailed information on survey types, methods, and bat roosting potential following best practice guidelines — specifically referencing Collins (2023) 4th Edition.
- Consideration of commuting and foraging routes for local bat species, particularly in relation to potential collision risk from turbines.
- Post-construction monitoring of bat strikes/fatalities, explicitly including the impact of carcass removal by scavengers on monitoring accuracy. The scoping response stated: *'A plan of action needs to be agreed at planning stage with the Planning Authority if the results in future show a significant mortality of birds and/or bat species.'*
- A Lighting Plan incorporating EUROBATs 8 Guidelines for Consideration of Bats in Lighting Projects and Dark Sky Ireland recommendations.
- Pre-consent engagement with NPWS on derogation requirements. The scoping response stated: *'where bridges require strengthening this may involve grouting of crevices which may function as bat roosts.'* It explicitly cited Hellfire Massey and required that derogation licences be applied for in advance of planning to avoid delays.
- The scoping response noted that hedgerows *'form important wildlife corridors'* and required that *'the connectivity of routes for the movement of these species is not compromised should any hedgerows have to be removed.'* It warned that *'adverse impacts from the removal of hedgerows could result in the natural range for bat species being reduced, thus impacting on their favourable conservation status.'*

Additionally, the Marnell et al. (2022) Bat Mitigation Guidelines for Ireland (NPWS IWM No.134), cited in the developer's own reference list, establishes operational curtailment as the standard mitigation for sites with confirmed high collision-risk species at moderate-to-high activity. NatureScot (2021), the developer's stated framework requires the collision risk assessment to consider the size and proximity of turbines in the surrounding landscape, including other wind farms.

The NPWS scoping response also stated in the context of bird surveys but applying with equal force to Annex IV bat species that *'results need to be referenced back to the overall local, regional, national and European populations and their dynamics as, in some cases even a small risk to a population of a species could be considered significant.'*

6.5.3 Survey Effort

The Bat Survey Report (Appendix 6-2, O'Donnell Environmental, April 2026) describes a multi-method survey programme. Eight species were confirmed (possibly nine, as Whiskered and Brandt's Bats are indistinguishable by echolocation):

- **Common Pipistrelle** — 50.5% of all registrations; HIGH collision risk; activity classified 'high' at six locations in summer and autumn 2024.
- **Soprano Pipistrelle** — 35.1%; HIGH collision risk; 'high' at three locations in summer 2024.
- **Leisler's Bat** — 9.5%; HIGH collision risk; Ireland's largest bat; acknowledged in the report as having 'a somewhat greater mortality risk at wind farms.' Moderate activity across all seasons with notable peaks: T1 averaged 168.6/night in autumn (peak 633); T11 averaged 176/night in spring (peak 801).
- **Nathusius' Pipistrelle** — 0.05%; HIGH collision risk; recorded in spring and autumn at multiple locations.
- **Natterer's Bat** — 1.82%; LOW collision risk.
- **Brown Long-eared Bat** — 1.53%; LOW collision risk; likely under-recorded due to low call volume; elevated activity at T11 linked by the report to a known roost within 1.6km.
- **Daubenton's Bat** — 0.69%; LOW collision risk; waterway specialist recorded at T9.
- **Whiskered Bat** — 0.84%; concentrated at T3 with spring peak of 187 nightly registrations.

Activity levels were deemed 'exceptionally high'. The summer 2024 site-wide nightly average was 3,675 registrations. Autumn 2024 exceeded this at 3,775. Single-turbine peaks included 1,319 Common Pipistrelle at T8 (12 August), 1,939 Soprano Pipistrelle at T5 (9 September), and 633 Leisler's Bat at T1 (15 September). T5 averaged 1,179 Common Pipistrelle registrations per night across the entire autumn season. These are not incidental passage

records — they demonstrate sustained, high-intensity use of proposed turbine locations throughout all survey seasons.

Roost features were uncovered. Confirmed non-significant roosts at S02 (200m from T6: Common Pipistrelle, Brown Long-eared Bat, Soprano Pipistrelle — three Brown Long-eared Bats found roosting on internal inspection) and S05 (>600m from T7: Common Pipistrelle, Soprano Pipistrelle, Natterer's Bat). Bridge B08 on the GCR held DNA-confirmed Brown Long-eared Bat droppings (SureScreen Scientifics DNA analysis, April 2025). Twelve PRF-I trees fall within bat-buffer clearance zones and will be removed. Nine BCI roost records have core sustenance zones overlapping the site. A major multi-species private roost within the BCI 30km search radius records eight species including all four high-collision-risk species.

6.5.4 Data Analysis

The analysis concluded that Site risk is scored as 'Medium' (score 3), overall collision risk is rated Medium for Common Pipistrelle and Soprano Pipistrelle (score 12) and Leisler's Bat (score 9) across all three seasons, and Low for Nathusius' Pipistrelle (score 3). Pre-mitigation residual impact is described as 'permanent, slight, negative' at local scale. With mitigation, the conclusion is 'imperceptible, negative.'

Five analytical deficiencies are identified:

1. The 'slight' conclusion contradicts the data and a comparable contemporary assessment.

A comparable Irish wind farm bat survey submitted in 2025 — same four high-risk species, eight species recorded, comparable activity levels, same NatureScot (2021) guidance concluded: *'without mitigation there will be a high level of impact at all turbine locations for either Leisler, Common or Soprano Pipistrelle.'* All turbines at that site were classified High Risk. The Ballincor data show comparable or higher nightly activity, yet the conclusion is reversed. No quantitative collision modelling is presented. No predicted annual bat mortality figure is calculated. No population-level assessment is conducted for any species. The report's own acknowledgement of 'knowledge gaps in relation to bats and wind farms, particularly in an Irish context' cannot coexist with a confident low-impact conclusion. The assessment permits reassuring conclusions from data that, on its face, demonstrates high-risk species intensively using turbine zones. Without quantitative modelling, the step from high activity to 'slight' effect is asserted, not demonstrated.

2. Nathusius' Pipistrelle is incorrectly classified as 'Low' risk. The developer's own vulnerability matrix (Table 4.3) places this species in the red zone — 'Rarest' population (<10,000) with 'High' collision risk. Yet low median activity washes the overall score to 3 (Low). This conflates frequency with population-level risk.

There are no dedicated surveys for this highly migratory species in Ireland and therefore data is very limited. The NPWS Article 17 Report (2019) states that it is unclear what range extent is required for the long-term survival of the species. Recent European research (Kruszynski et al. 2022) identifies Nathusius' Pipistrelle as the second-ranked species for wind turbine fatality in Germany, with juveniles disproportionately affected. The comparable Irish application classified Nathusius' Pipistrelle as high collision-risk and applied curtailment. When national baseline data is this poor, concluding 'low impact' on a species consistently present across the survey area is subjective and scientifically unsupported. For a migratory species, maximum-percentile risk classification is the appropriate metric, not the median.

3. No species-specific analysis for Leisler's Bat despite acknowledged greatest risk. The report states Leisler's Bat has 'a somewhat greater mortality risk at wind farms' and 'typically does not follow landscape features such as treelines or woodland edges.' These two facts together mean the vegetation buffer mitigation offers no protection to the species most at risk — a fundamental contradiction the assessment does not address. Ireland holds the global stronghold population (63,000–113,000; NPWS Article 17, 2019). Therefore we have an international responsibility for its protection.' The species is listed as 'Near Threatened' in Ireland; its rarity across the rest of Europe makes the Irish population of exceptional international conservation importance. This international responsibility is entirely absent from the Ballincor documentation. No population-level mortality assessment is conducted. No species-specific curtailment is proposed.

4. The Ecobat tool was rejected without reproducible Irish replacement. NatureScot (2021) recommends the Ecobat online tool to provide standardised, comparative activity classification. The report explicitly rejects the use of ECOBAT, the standard tool for benchmarking bat activity against comparator sites. The stated rationale is that ECOBAT's database is UK-weighted and therefore unreliable for Irish conditions. Instead, activity categorisation (Low, Moderate, Moderate-High, High) relies entirely on "the expertise and experience of the authors." The report provides average nightly registrations and peak counts per detector per season but offers no quantified percentile analysis, no statistical framework, and no transparently documented thresholds for how activity categories were assigned. The activity classification underpinning the entire collision risk assessment is therefore non-

reproducible and unfalsifiable. An Coimisiún Pleanála has no way to independently verify whether 'Moderate' activity at Ballincor is comparable to or higher than other Irish wind farm sites.

5. The cumulative assessment is circular and substantively absent. The proposed development will create a 23-turbine cluster within 3km (Skehanagh 5 turbines at 1.5km; Carrig 7 turbines at 1.5–3.9km; Ballincor 11 turbines). The assessment treats each neighbouring farm as 'existing baseline' or relies on the other developer's self-assessed nil-residual-effects conclusion. No combined collision mortality figure is produced. No post-construction bat data from 20 years of Skehanagh operation was sought. No assessment of cumulative commuting habitat fragmentation across the cluster is provided. No assessment of additive collision pressure on roost populations whose core sustenance zones overlap multiple sites is presented. The EIAR's claim of 'absence of important shared/geographically connected KERs' between Ballincor and Carrig is contradicted by shared species assemblages, shared habitats, and shared roost catchments. This structural gap, where nil plus nil is treated as proof of nil cumulative effect in no way represents a legitimate or cumulative impact assessment nor can it be accepted as such.

6.5.5 Mitigation Assessment

The Bat Survey Report proposes two operational mitigation categories: vegetation buffers (80–104m radius per turbine, requiring clearance of 0.12 ha of treelines/hedgerows and 5.76 ha of woodland/scrub) and feathering of idling blades. The report states: 'No additional control measures to avoid/reduce collision related bat fatalities are considered warranted in this instance.' MM89 in Chapter 20 defers any curtailment to post-construction monitoring: 'Recommendations will be made in relation to a curtailment strategy if required.'

Absence of operational curtailment. This is the most significant mitigation failure. The Ballincor approach is to defer the curtailment decision to post-construction monitoring. This is the "monitor-and-hope" approach.

Operational curtailment is the international standard, with published evidence demonstrating 50–90% fatality reductions (Arnett et al. 2011; Adams et al. 2021; Baerwald et al. 2009). Ballincor's approach, where curtailment is a possibility that may never materialise, is fundamentally different. Feathering addresses only turbines not generating power; the risk period for bats (low-to-moderate wind speeds of 3–6 m/s) is when turbines are actively generating and feathering does not apply.

Ballincor, with opaquely categorised "moderate to high" activity and Medium collision risk scores, proposes no curtailment at all unless post-construction monitoring reveals a problem. This means the developer is proposing to operate 11 turbines with 180m tip heights in a landscape with confirmed moderate-to-high pipistrelle and Leisler's activity, confirmed roosts within the search area (Common Pipistrelle and Brown Long-eared at S02), a tree with maternity colony potential (T716), and proximity to waterways, without any operational restriction on turbine rotation during peak bat activity conditions.

The first bat killed at this site under the proposed mitigation package would constitute a foreseeable and avoidable mortality that the developer chose not to prevent, even though the industry standard is to implement precautionary curtailment from Day 1 at sites with Medium or higher collision risk.

Buffer clearance creates unassessed additional harm. Implementing buffers destroys the primary commuting and foraging habitat for Pipistrelle species (85.6% of all registrations). The report cites Altringham and Kerth (2016) confirming that gaps under 5m interrupt commuting bats; the clearance creates 80–104m breaks. Replacement features will take 5–7 years to reach functional height — the highest-risk period for collision, unassessed. No net assessment — collision risk reduction versus corridor destruction — has been conducted. No operational method statement for buffer maintenance is provided. The NPWS scoping response specifically warned that 'adverse impacts from the removal of hedgerows could result in the natural range for bat species being reduced.'

Monitoring falls below NPWS requirements. The scoping response explicitly required scavenger correction. The programme does not commit to scent-detection dogs (73–95% vs 20% detection — Mathews et al. 2013), does not specify search radius or interval, does not commit to necropsy for barotrauma (25–50% of bat fatalities show no external injury — Mathews et al. 2016), and covers only 5 monitoring years versus 10 years as standard in the sector. There are no pre-defined fatality thresholds triggering binding curtailment. A monitoring programme that can detect mortality but has no mechanism to act on findings is not mitigation.

Regulation 54 / Article 12 unresolved. The report concludes no derogation is required. However, 12 PRF-I trees in clearance zones may support transitory roosting (Kaňuch et al. 2022,

cited in the report). Bridge B08 holds a DNA-confirmed roost; the directional drill vibration profile at the roost is unquantified. Critically, the developer's own acknowledgement of predicted permanent negative effects on Annex IV species engages the Drumakilla analysis: accepted likelihood of mortality constitutes deliberate killing under Article 12, requiring pre-consent derogation.

6.5.6 Grounds for Objection

Ground 1 — Internal inconsistency and opaque activity categorisation. The 'slight' pre-mitigation conclusion cannot be reconciled with site-wide nightly averages exceeding 3,675 registrations and four high collision-risk species at Moderate-to-High activity. No quantitative collision modelling, no predicted annual mortality, and no population-level assessment is provided. The activity categories underpinning the collision risk assessment cannot be independently verified: the report rejects ECOBAT as unsuitable for Ireland but provides no equivalent quantified benchmarking framework, relying instead on unspecified professional judgment. Ballincor's raw data — with peaks exceeding 1,000 registrations per night at multiple locations — could plausibly yield High activity categories under any reproducible benchmarking, which would push collision risk scores to 15 and trigger mandatory curtailment under NatureScot guidance. Board cannot satisfy itself that the risk has been properly characterised when the categorisation methodology is opaque. This is a lacuna under *Holohan*.

We do not dispute that professional judgment may inform activity categorisation, but require that the Board be provided with the documented thresholds, comparator datasets, or percentile methodology by which each category was assigned, such that the categorisation can be independently verified. In the absence of this documentation, the Board is asked to treat the activity categories as unverified.

Ground 2 — No operational curtailment despite Medium collision risk. The primary evidence-based mitigation for bat collision at wind farms — operational curtailment of cut-in speeds — is explicitly absent. Curtailment is deferred to a post-construction 'recommendation if required' with no trigger thresholds, no algorithm, and no enforcement mechanism. Feathering alone does not operate during the risk period when turbines are generating above cut-in speed. This reverses the precautionary principle: curtail from Day 1, then relax restrictions if monitoring confirms low post-construction activity — is the precautionary approach; the Ballincor approach — operate unrestricted, then impose restrictions if monitoring reveals mortality, treats bat deaths as an acceptable data-gathering exercise.

Under *People Over Wind*, hypothetical future mitigation cannot carry the weight of an AA conclusion.

We ask that the developer be required to specify to the Inspector (a) the number of bat fatalities per turbine per year that would trigger curtailment; (b) the cut-in speed, temperature threshold, and temporal window that would apply; (c) the body responsible for the decision; and (d) the enforcement mechanism ensuring implementation. In the absence of these specifications, the curtailment commitment is not a mitigation measure — it is an aspiration.

Ground 3 — Unassessed net harm from buffer clearance. The primary spatial mitigation destroys commuting habitat, creating 80–104m breaks where 5m interrupts bat movement. No net mortality assessment. No method statement. The NPWS scoping response warned against exactly this impact on hedgerow connectivity. The replacement planting will take a minimum of 10–15 years to reach functional hedgerow height. During this period, the bat-buffer clearance zones will function as barriers to commuting bats. No assessment has been provided of the additional collision risk created by displacing commuting bats from their established routes into open airspace at rotor height during this interim period. The Altringham et al. (2011) 5m gap threshold cited in the developer's own report applies to these cleared zones.

Ground 4 — Nathusius' Pipistrelle misclassification. A data-deficient, high-collision-risk Annex IV species in the red zone of the developer's own matrix is washed to 'Low' by conflating low median activity with low population risk. The precautionary principle requires the opposite conclusion for a species with no known Irish roosts and unknown Favourable Reference Range.

Ground 5 — Cumulative assessment absent. A 23-turbine cluster within 3km, no combined mortality estimate, no Skehanagh post-construction data, no cumulative habitat fragmentation assessment, no additive pressure analysis on shared roosts. The circular nil-effects methodology applied across this full submission, also applied to bats is wholly unacceptable.

Ground 6 — No Leisler's Bat species-specific mitigation. The report acknowledges Leisler's Bat has the greatest mortality risk and does not follow landscape features. The buffer mitigation cannot protect it. Ireland holds the global stronghold population. No curtailment, no population-level assessment, no acknowledgement of international responsibility. The buffer mitigation cannot protect the species that the report identifies as having the greatest mortality

risk. This is not a marginal gap — it is a structural failure of the mitigation framework for the species for which Ireland holds the international stronghold population."

Ground 7 — Monitoring below NPWS and industry standard. No scavenger correction despite explicit scoping requirement. No search dogs. No necropsy. No binding fatality thresholds that would trigger additional mitigation. The monitoring schedule (years 1, 2, 3, 5 and 10) covers less than a third of the operational lifespan. For a 30+ year wind farm with confirmed bat populations and Medium collision risk, the Ballincor schedule is insufficient to detect long-term population-level effects or to adapt the curtailment strategy that has itself been deferred to this monitoring programme.

Ground 8 — Article 12 / Regulation 54 unresolved. The developer acknowledges predicted permanent negative effects on Annex IV species but concludes no derogation is required. The developer's own collision risk assessment yields Medium scores (9 and 12) for three high-risk species, the report concludes the operational phase will have 'permanent, slight, negative' effects on bats, and the standard operational mitigation (curtailment) that would reduce foreseeable mortality by 50–90% has been explicitly omitted. To 'design to avoid' while omitting the primary avoidance tool is a contradiction. Under *Drumakilla*, accepted likelihood of mortality constitutes deliberate killing under Article 12. The survey confirmed Common Pipistrelle and Brown Long-eared Bat roosting at derelict building S02 and identified a potential maternity colony feature on tree T716, both within the zone of influence of proposed turbines. The mitigation response to these confirmed ecological features — feathering only, no curtailment — is disproportionate to the risk they represent and does not discharge the protective obligations that arise from their confirmed presence. Bridge B08 and 12 PRF-I trees raise pre-consent derogation obligations under *Hellfire Massey*. Neither has been discharged.

6.5.7 Conclusion

The bat assessment fails on eight grounds. Each constitutes a lacuna under Holohan or a failure of proof under Waddenzee. Taken together, they prevent An Coimisiún Pleanála from ascertaining beyond reasonable scientific doubt that the development will not adversely affect the Article 12 strict protection obligations owed to all Irish bat species.

The critical failures are: no quantitative collision modelling; no pre-consent curtailment despite four high collision-risk species at Moderate-to-High activity; unassessed net harm from buffer clearance; misclassification of a data-deficient migratory species; absent cumulative assessment across a 23-turbine cluster; no species-specific mitigation for Leisler's Bat despite

Ireland's global stronghold responsibility; monitoring below NPWS scoping requirements; and unresolved Article 12 derogation obligations.

The developer has expressly waived both derogation pathways. With no fallback available, refusal is the only outcome consistent with the precautionary principle, the lacunae standard, and Ireland's obligations under the Habitats Directive.

6.6 KER 5 — Flora and Fauna

6.6.1 Slender Cottongrass (*Eriophorum gracile*)

The NIS (p.55) states:

*"A review of the NPWS Flora Protection Map (NPWS, 2025a) show record of Slender Cottongrass (*Eriophorum gracile*), a plant species listed under the Flora Protection Order (FPO) within the 10km grid squares encompassing the study area. This plant species was recorded in 2015 and 1997, within the raised bog and degraded raised bog habitat, 1.1km east of the proposed wind farm site and within the Sharavogue Bog SAC. Data obtained from NPWS from a sensitive data request also included the above record. No other protected flora species have previously been recorded within the 10km grid squares N00 and S09 or within the proposed project site over the past 20 years."*

The NPWS Site Synopsis states:

*"The rare semi-aquatic plant species Slender Cottongrass (*Eriophorum gracile*) has been recently discovered growing in fen vegetation at this site. This species is legally protected under the Flora (Protection) Order, 2015."*

And more precisely, the Site Synopsis locates it in the **eastern lagg zone** — not in the central high bog — specifically in the calcareous fen and carr woodland habitat supported by upwelling base-rich groundwater along the eastern margin. The raisedbogs.ie document confirms it occurs in the southern zone of the lagg where minerotrophic influence is dominant, associated with *Schoenus nigricans* fen vegetation in pools and mosaic woodland.

6.6.2 Grounds for Objection

Ground 1 — The species is recorded in the wrong location and no survey of the lagg zone or the species' supporting habitat was undertaken

The NIS describes the record as being "1.1km east of the proposed wind farm site and within the Sharavogue Bog SAC." The Site Synopsis and the raisedbogs.ie flora document both place *E. gracile* firmly in the **eastern lagg zone** of Sharavogue Bog — the narrow transitional fringe of upwelling groundwater immediately adjacent to the wind farm boundary. The eastern lagg is the very feature that is closest to the proposed construction activities, not some distant location in the bog interior. The NIS's use of the 1.1 km figure to characterise the species' distance from the works is therefore misleading. No botanical survey of the SAC lagg zone

was conducted at any point in the application process. The applicant's surveys searched the wind farm site itself for FPO species but conducted no survey of the interface zone, the lagg fen, or the calcareous fen vegetation where *E. gracile* is recorded and on public record as such.

Ground 2 — No assessment of the pathway from near-surface groundwater disturbance to *E. gracile*'s supporting hydrology

Eriophorum gracile is a semi-aquatic species that occurs exclusively in base-rich, spring-fed or groundwater-fed fen conditions. It is not a generalist wetland plant. Its presence at Sharavogue is explicitly linked to the upwelling of base-rich water in the eastern lagg — the same near-surface groundwater system that EIAR Chapter 9 records operating at the interface between the wind farm site and the SAC. This species cannot persist if that base-rich upwelling is disrupted, lowered, or chemically altered.

The NIS records the species, notes its Flora Protection Order status, and then performs no assessment of the pathway from the confirmed near-surface groundwater disturbance to the species' supporting hydrology. It is mentioned, catalogued, and dropped. There is no analysis of what effect altered drainage, peat excavation at T8/T9, or near-surface water table drawdown during construction would have on the fen conditions in the lagg where the species is recorded.

Ground 3 — The Flora Protection Order creates an independent statutory obligation not addressed

Eriophorum gracile is protected under the Flora Protection Order 2015 (and confirmed under FPO 2022). This creates a direct, free-standing statutory prohibition on wilful cutting, uprooting, or destruction. Where a project may affect a FPO-listed species or its habitat — including through indirect hydrological disturbance — the EIAR must demonstrate avoidance, assess the pathway, propose mitigation, and address the question of whether an NPWS licence would be required. None of this appears in the submitted documents. The species is noted as existing in the SAC 1.1 km away and the analysis stops there entirely. There is no assessment of indirect effect, no mitigation proposed, and no licence application referenced.

6.6.3 Conclusion

This species is the single most ecologically significant flora record in the entire application area. Its presence in the lagg zone is confirmation that the base-rich groundwater upwelling system documented in EIAR Chapter 9 is functioning and biologically productive right at the interface between the construction zone and the SAC. A species of this rarity and hydrological specificity does not persist in degraded conditions — its presence is direct ecological evidence that the near-surface groundwater system is actively delivering base-rich water to the lagg at the present time. Disruption of that system is therefore not a theoretical risk: it is a risk to a confirmed, legally protected species at a confirmed location within the receptor site.

The *E. gracile* record reinforces and compounds the Article 6(3) gap

Under *Sweetman* (C-258/11, para.48), adverse effect on integrity includes any disruption to the constitutive characteristics of a site. The lagg zone — including the *E. gracile* population — is formally identified in the NPWS documentation as the primary element of local distinctiveness at Sharavogue Bog, described as one of the best developed lagg systems in the country and unique in the context of Irish raised bogs. Any risk to the hydrology sustaining that feature is a risk to the constitutive characteristics of the site. That risk has not been assessed. The NIS's conclusion of no adverse effect cannot stand in the face of a confirmed FPO species whose entire ecological support system is directly connected to the groundwater pathway the NIS itself identified in Table 6-1 and then failed to trace to its receptor.

6.7 KER 6 — Otter (*Lutra lutra*)

6.7.1 Legal Status

Otter is listed on both Annex II and Annex IV of the Habitats Directive. The Annex IV listing places the species under Article 12 strict protection wherever it is found, whether or not within a designated site. Otter holts and couches are protected under Regulation 51 of the European Communities (Birds and Natural Habitats) Regulations 2011-2021. Damage to any holt or couch requires a derogation under Regulation 54. Otter is also a qualifying interest of the River Shannon Callows SAC (000216), approximately 14 km north of the site.

6.7.2 What Was Required

The NPWS scoping response cited the Hellfire Massey judgment by name and stated its requirement directly: where a derogation licence is necessary, it must be obtained in advance of the grant of planning permission. This is the most unambiguous species-specific pre-consent obligation in the scoping document. The scoping response also required maintenance of a 10-metre riparian buffer on both banks of any waterway as part of otter habitat, and stated that the development must be located at least 10 metres from any watercourses.

6.7.3 Survey Effort

Otter surveys were conducted during multidisciplinary walkover visits integrated with habitat mapping, flora, badger, and other mammal surveys. No individual survey dates, durations, or reach lengths are recorded for any otter survey visit. No surveyor qualifications are stated for otter surveys. One potential holt was identified on a drainage ditch approximately 80 m from construction compound 3 near T7. It was recorded as inactive across four survey years.

Appendix 6-3 acknowledges access constraints in the drainage ditch network: "Due to the topography of the site, high density of bog land and deep drainage ditches, there was limited access to drains within the proposed wind farm site boundary." The one potential holt identified is located on this network. The access constraints that limited the aquatic survey programme applied equally to the holt search. This limitation is not acknowledged in EIAR Chapter 6 or the NIS as affecting the completeness of the holt baseline.

The survey buffer was 150 metres from waterbodies. The developer acknowledges that natal dens can be located as far as 1 km from waterbodies. No survey was conducted in the zone between 150 m and 1 km that includes woodland and scrub along the eastern site boundary.

6.7.4 Data Analysis

NIS Table 6-4 records two potential adverse effects on the otter qualifying interest of the River Shannon Callows SAC: disturbance and degradation of feeding resources, and potential degradation of water quality in the Little Brosna_040, reducing fish biomass. Both are resolved in the NIS by reference to the SWMP. As established in KER 2 (Ground 8), the SWMP fails under flood conditions at T8 and T9 — the turbine locations closest to the Little Brosna, the primary otter foraging corridor. The SWMP failure mode directly undermines the SAC otter qualifying interest mitigation.

6.7.5 Mitigation Assessment

The timing restriction (MM42 — daytime working within 150 m of watercourses) does not address disturbance to holts during daylight hours. All construction activity other than civil twilight working proceeds during the day regardless of holt proximity. No exclusion zone is defined around the identified potential holt. The pre-construction survey commitment (Section 6.7.1.5.3.2.2) is a post-consent measure. If it discovers an active holt, the response protocol refers to "consultation with NPWS" but provides no lawful mechanism for proceeding without a Regulation 54 licence.

6.7.6 Grounds for Objection

Ground 1 — No pre-consent determination has been made as to whether a Regulation 54 derogation licence is required — the Hellfire Massey obligation has not been discharged:

Otter is an Annex IV species. One potential holt was identified within the development footprint and acknowledged as potentially capable of reoccupation (EIAR Chapter 6, Section 6.6.3.2.2.2). Hellfire Massey (ECLI:EU:C:2023:545): where a derogation licence is necessary, it must be obtained before planning permission is granted (NPWS Scoping Response p.9). Regulation 51: the protection applies to the feature, not the occupant — an inactive holt that is reoccupied is protected from the moment of reoccupation. No derogation licence application has been submitted. No determination has been made — by the developer or by NPWS — as to whether Regulation 54 is engaged. The EIAR and CEMP defer this question to the pre-construction phase.

Ground 2 — The holt survey is incomplete — access constraints in the drainage ditch network are not acknowledged as limiting the Annex IV baseline: Appendix 6-3 records that access constraints in the drainage ditch network limited the aquatic survey programme. The one potential holt identified is located on that same network. These constraints are not acknowledged

as limiting the completeness of the holt baseline. The conclusion that only one potential holt exists within the works corridor cannot be stated with confidence.

Ground 3 — The survey effort cannot be independently verified — no individual dates,

durations, or reach lengths are recorded: EIAR Chapter 6 and the NIS state that otter surveys were conducted during various dates between 2022 and 2025, integrated into multidisciplinary walkovers. No individual otter survey dates are stated. No survey durations per visit are stated. No watercourse reach lengths searched per visit are stated. No surveyor qualifications are documented. NPWS Scoping Response: "details of survey methodology should also be provided." For an Annex IV species where the survey forms the foundation of a pre-consent Regulation 54 determination, the survey record must be capable of independent verification

Ground 4 — The NIS confirms potential adverse effects on the otter qualifying interest of the River Shannon Callows SAC and relies on mitigation that fails under foreseeable site

conditions: NIS Table 6-4 records potential adverse effects on the SAC otter qualifying interest — disturbance and water quality degradation — resolved entirely by the SWMP. As established previously, the SWMP fails under 1% AEP flood conditions at T8 and T9, which are the construction locations closest to the Little Brosna. Under flood conditions, untreated construction sediment is discharged to the main otter foraging corridor without interception. This is the confirmed flood regime at the most critical locations. People Over Wind (C-323/17, 2018): mitigation must be assessed in full. Waddenzee (C-127/02): the competent authority cannot approve a project if adverse effects on European site integrity cannot be excluded. Both derogation pathways are waived. A no-adverse-effect conclusion for the SAC otter qualifying interest resting on mitigation that fails under foreseeable site conditions does not satisfy Article 6(3).

Ground 5 — The disturbance assessment is conditional on a pre-construction survey that cannot cure a pre-consent Annex IV deficiency:

EIAR Section 6.6.3.2.2.2 concludes that disturbance without mitigation is "a likely short-term, significant negative effect." The residual effects table resolves this to "not significant" after mitigation. The mitigation relied upon for this resolution includes a pre-construction survey — a post-consent commitment. If that survey discovers an active holt, the response protocol defers to "consultation with NPWS" but provides no lawful mechanism for proceeding without a Regulation 54 licence. The no-

adverse-effect conclusion for disturbance is contingent on outcomes that cannot be verified at planning application stage

APPENDIX 4: Hydrology

Chapter 3: Hydrology, Hydrogeology, Peat Stability and Flood Risk

Appendix 3-1	Hydro G Expert Report
Appendix 3-2:	Hydro G Appendix, supporting documentation

3.0 Introduction

When RWE proposed a windfarm on this site the local community were most concerned by the hydrological challenges it would present. This is a floodplain, bordered by a river in documented decline, lying within ten metres of a Special Area of Conservation, and dependent on a fragile and actively recovering water-table system. The Little Brosna River and Sharavogue Bog SAC are both within or immediately adjacent to the development, and both are in active, State-funded restoration.

Local knowledge confirms what the modelling only partly captures. While the flood maps describe 1-in-100 and 1-in-1000-year events, the lived reality is that this floodplain inundates extensively every winter, from November to March, with depths exceeding a metre in places and large areas left impassable for five months of the year. The flooding is not a remote probability; it is an annual certainty.

Large-scale construction, deep piled foundations and extensive peat excavation in this setting will inevitably bear on groundwater levels and flow, river hydromorphology and the ecology of the SAC. The constraints of the site are not merely difficult, they are mutually irreconcilable. An engineered solution to one problem creates a different problem elsewhere. That is itself significant. In *Coolglass Wind Farm Limited v An Coimisiún Pleanála* [2026] IESC 5 (paras 103–105), the Supreme Court recognised that a consenting body may not be required to act consistently with its statutory objectives "where it is not practicable to do so" — "**practicable**" meaning capable of being carried into action having regard to the practical difficulties that exist. The difficulties on this site go to the heart of whether consent is practicable at all.

The hydrological and hydrogeological effects of this proposal bear on an extraordinary concentration of sensitive receptors: the Little Brosna, Sharavogue Bog SAC and its lagg zone, the Shinrone Groundwater Body, the six European sites downstream — including the Callows SPAs and the River Shannon Callows SAC and, beyond them, Lough Derg as a strategic drinking-water source. Few sites place so many vulnerable systems within reach of a single construction footprint. Given that, and the technical complexity of the proposal the Greater Birr Wind Action Group commissioned independent expert review.

This chapter is informed throughout by the expertise of Dr Pamela Bartley (Hydro-G), a chartered hydrogeologist and water-focused civil engineer with over 25 years of field practice in borehole drilling, groundwater monitoring and the assessment of construction impacts on hydrology, IOSH-certified as Project Supervisor for the Design and Construction Stage. Her full report is appended as Appendix 3-1, with supporting scientific literature at Appendix 3-2. The Inspector is asked to read Appendix 3-1 in full before the grounds below.

This review addresses hydrology, hydrogeology, peat stability, flood risk, and compliance with the Water Framework Directive (WFD) and the Habitats Directive. All evidence cited is drawn exclusively from the applicant's own Environmental Impact Assessment Report (EIAR), Natura Impact Statement (NIS), WFD Compliance Assessment (Appendix 9-1), and supporting appendices. Every page and section reference is to those documents.

This matters because the applicant has expressly waived both derogation pathways. The WFD Assessment (Appendix 9-1, p.28) confirms the project "does not require assessment under Article 4.7"; the NIS (p.4) confirms "no reliance" is placed on Article 6(4) IROPI. There is no flexibility and no fallback. Full, unqualified compliance with Article 4(1)(a) of the WFD and Article 6(3) of the Habitats Directive must be demonstrated on the application exactly as filed. This chapter demonstrates that it cannot be.

Twelve grounds of objection follow. They are evidentially independent — each would justify refusal on its own — but they also compound one another, and their combined effect is greater than the sum of its parts.

3.1 Summary of Grounds

Ground 1 — The Wrong Baseline: WFD Poor Status and the Weser Prohibition.

The applicant's entire water-quality assessment rests on a classification its own documents contradict. EIAR Chapter 9 treats the receiving waters as *Moderate*; the applicant's own WFD specialist (Appendix 9-1) records the sub-basin that actually contains the development as having deteriorated from *Moderate* to *Poor*, At Risk, confirmed by Poor monitoring results at Riverstown Bridge. Under the *Weser* judgment (C-461/13), any deterioration of any quality element in a Poor-status water is prohibited outright, and the applicant has waived the only legal route around that prohibition. A compliance case built on a baseline the applicant's own evidence disproves cannot stand.

Ground 2 — The AFA Programme of Measures: A Legal Test Set Up, Then Abandoned.

The site sits inside the Little Brosna Area for Action, a State-led restoration programme established to reduce the very pressures — peat disturbance, drainage, nutrients — that this development would add. The applicant's own assessment correctly identifies the WFD test for compatibility with that programme, recites every relevant fact, and then simply stops without applying it. A separate assertion that the site will not cause local deterioration answers a different question and cannot discharge this one. A test identified, populated with facts, and left unanswered is the precise lacuna *Holohan* (C-461/17) prohibits.

Ground 3 — Phosphorus and Iron: The Pollutants That Matter Most Were Not Measured or Cannot Be Removed.

The EIAR names phosphorus as the main issue for water quality in this catchment, then fails to measure it: phosphate was dropped from the reported results despite being part of the laboratory method actually run. Iron ochre is visible in the applicant's own site-investigation photographs, yet iron appears nowhere in the baseline or the monitoring triggers. The omission is decisive because the proposed mitigation cannot address it — settlement ponds remove solids by settling, but phosphorus and iron travel in dissolved form, which settling does not capture. The applicant has neither

characterised the two pollutants that govern this catchment nor proposed controls capable of stopping them.

Ground 4 — The Tributaries: The Real Discharge Pathway, Largely Unassessed.

Construction runoff does not reach the Little Brosna directly; it reaches it through a network of smaller streams that cross the site — the true first link to every downstream European site. The applicant's own ecologist rates one of these, the Pallas Kylenamuck, as *Bad / Seriously Polluted*, one step from the floor of the scale, with no assessment of further deterioration. Five other named tributaries, including the site's primary discharge pathway, were never sampled at all. A no-adverse-effect conclusion cannot rest on baselines that were either never measured or recorded as Bad and then ignored.

Ground 5 — Construction in Flood Zone A/B and the Failure of the Justification Test.

Four turbines sit in Flood Zone A/B on the applicant's own mapping, with T9 three-quarters inundated under the climate scenario the applicant itself adopts. The Justification Test fails on every criterion. The contradictions are on the face of the documents: the SWMP requires an environmental clerk of works on site during the very rainstorms the FRA says make the access roads unusable; the drainage features cannot work under flood; and the principal stormwater structure is drawn below the FRA's own mandatory flood level. The mitigation cannot function under the conditions that define the site.

Ground 6 — Access Tracks in Flood Zone A/B: No Investigation, No Design, No Mitigation.

The applicant claims ground investigation informed the access-track design in the critical eastern corridor. It did not: no trial pit or borehole was placed along that alignment, where the peat is deepest and the SAC closest. The three investigation points nearby found no stable founding layer — two collapsed, and the third recorded nearly thirteen metres of near-liquid silt. Neither of the applicant's two design options is workable on that data, and the track design is openly deferred to a specialist who has not been appointed. The infrastructure in the most sensitive zone on the site has not, in substance, been designed.

Ground 7 — Construction Loading on the Floodplain: A Flood-Risk Mechanism Never Assessed.

Four turbines and much of the access network sit on a working floodplain whose value lies in its capacity to absorb floodwater. Compacting saturated peat destroys that capacity, and the same flows then rise higher. The application contains no ground-pressure assessment, no compaction analysis, and no study of this effect at all. The Flood Risk Assessment, by its own terms, considers only the risk to the developer's infrastructure — never the flood risk the development creates for the adjacent SAC, whose modelled flood extent already reaches the site boundary. A mechanism capable of raising flood levels against a Priority Habitat in active restoration has simply not been characterised.

Ground 8 — Peat Stability: Contradicted Data, Deferred Mitigation, and the Meenbog Precedent.

Nine of twelve peat trial pits collapsed during investigation. The applicant describes the peat as low in moisture and easy to manage; its own laboratory data records moisture content up to 946%, with a median near saturation. The "Negligible" risk rating at the three worst locations depends entirely on a "specific temporary works design" that does not exist — and that the applicant's own assessor says cannot be prepared until further investigation, not yet carried out, is done. Meenbog (2020) is the direct precedent: an EIAR that rated peat failure "trivial and tolerable," before roughly 86,000 m³ of peat slid into protected sites. The same conditional template is relied on here.

Ground 9 — Karst and the Shinrone Groundwater Body: A Single-Sentence Assessment.

Part of the site overlies a Regionally Important Karstified Aquifer hydraulically connected to the SAC, yet the entire karst assessment is one sentence: no karst was seen during the walkover. The applicant concedes elsewhere that karst beneath the peat could not be detected by a walkover. The "low vulnerability" rating it relies on is itself a product of the protective peat layer — the very material the project is designed to excavate. Unlined borrow pits dug through peat into a karst substrate, in the gradient toward the SAC, are precisely the scenario left unassessed.

Ground 10 — Hydrogeological Connectivity to the SAC: An Unbridged Lacuna.

The threshold question for the SAC is whether a hydrogeological pathway exists. The

applicant's own NIS answers both ways: one table records a groundwater connection to Sharavogue Bog and identifies a potential for adverse effect; the next declares no pathway and no potential effect — with nothing in between to explain the reversal. Two physical pathways are documented in the applicant's own file: near-surface upwelling evidenced at the eastern margin, and a mapped gravel-and-esker "window" lying inside the red line that the applicant has drawn around and excluded. Neither has been characterised. A no-adverse-effect finding reached without resolving connectivity is the lacuna *Holohan* forbids.

Ground 11 — The Gravels-and-Esker "Window" Excluded by the Red Line.

The applicant has drawn its boundary to circle out a GSI-mapped pocket of gravels and a connected esker lying within the application area, presenting it as separate from the development. It is not separable. The same cut-over peat subsoil is mapped on both banks of the Little Brosna, so the river links identical subsurface systems; a peat-to-gravel boundary is a recognised setting for high-volume groundwater discharge; the gravels form a "window" through which groundwater emerges from the underlying bedrock; and the mapped end of the esker coincides with the start of a surface-water system — a probable spring. Turbines T1–T4 will impose construction and crane loads at the margin of this feature, yet its hydrogeological function and its potential as a preferential pathway toward Sharavogue Bog SAC have not been characterised, because the feature has been defined out of the assessment. A no-adverse-effect conclusion reached without assessing a mapped groundwater conduit inside the application lands is the lacuna *Holohan* prohibits, and cannot be cured by condition.

Ground 12 — Construction Dewatering and Drawdown: The Quantitative Assessment Is Absent.

Eleven foundations, three borrow pits, a substation and a battery compound will be dewatered through saturated peat with the water table near surface — yet the application contains no drawdown calculation, no groundwater model, no permeability testing, and no monitoring point inside the SAC. The 100-metre zone of influence asserted in a single sentence is contradicted by peer-reviewed Irish field evidence from a comparable raised bog, where drawdown reached 150–250 metres and subsidence was detectable at 900. The certainty *Waddenvereniging* and *Sweetman* require cannot come from analysis that was never done.

Ground 13 — Stepping Back: Maladaptation and the Absence of Alternatives.

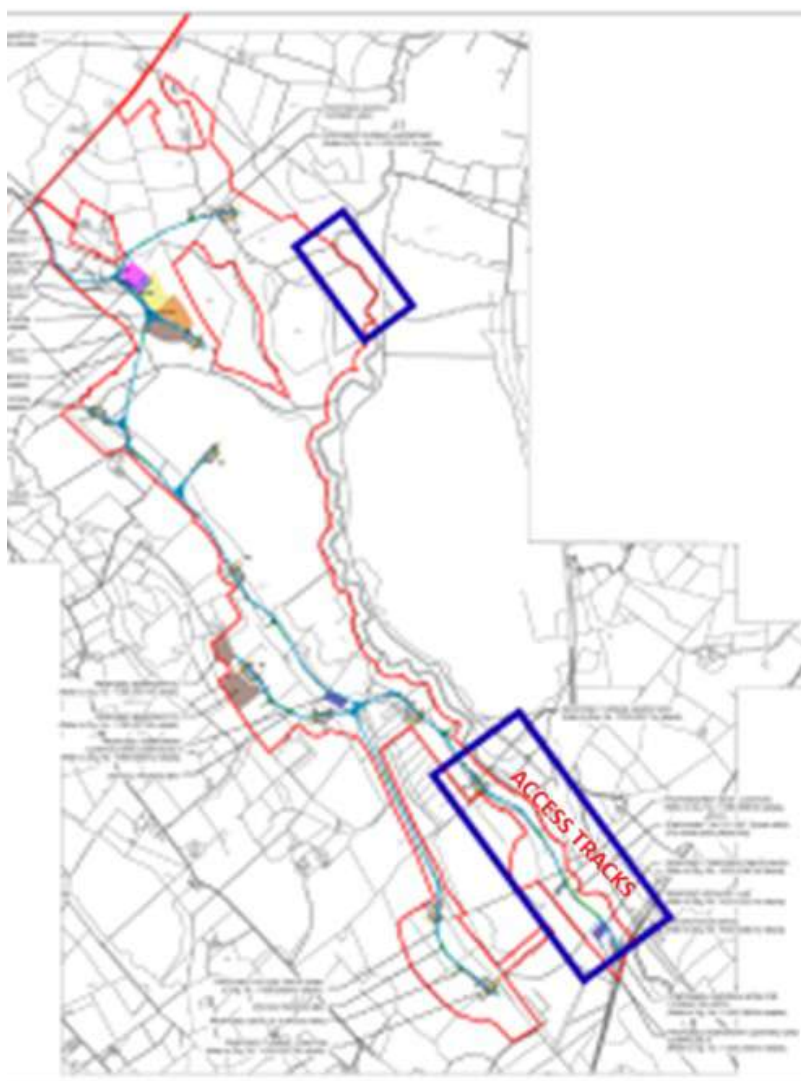
A project that excavates tens of thousands of cubic metres of carbon-storing peat, compacts a floodplain, undermines a State-funded restoration programme and adds pressure to a Poor-status waterbody is, on its face, in tension with the maladaptation principle national climate policy requires consenting authorities to weigh — yet the application offers no carbon accounting and no floodplain-function analysis. Nor does it carry out the alternatives assessment the EIA Directive requires: the applicant calls this site "the most suitable," but "most suitable" is a ranking, not a finding of suitability, and it is pursuing all its identified alternatives at once. *Coolglass* asks whether consent here is even practicable. The application never answers.

3.2 The Site and Its Hydrological Context

The hydrological context of this site is the most significant environmental factor in this application and must be understood before the individual grounds are assessed.

The Little Brosna River flows along the eastern boundary of the wind farm site from south to north before joining the River Shannon approximately 20km to the northwest (Appendix 9-1, p.7). The river Shannon is the largest river system in Ireland and is an important cultural, biodiversity habitat and drinking water source. See Figure 3.1 below highlighting the overlap between river and perimeter. This is not a distant receptor. The river Brosna is chosen in places to be the actual boundary line of the development, it is immediately adjacent to Turbines T8 and T9, and within the active floodplain of T1, T2, T8 and T9 as established by the applicant's own Flood Risk Assessment (Appendix 9-3). Access tracks are proposed directly adjacent to the river at the Southern end. See map below.

Figure 3.1 Map of Access Tracks and River



The magnified view of the Access Tracks area below shows that at several points the distance between river and proposed access track is negligible. No planning drawing states that distance. This is in and of itself a material omission. Given the proximity highlighted below it is likely less than 20m.

Figure 3.2 Magnified view: Map of Access Tracks and River

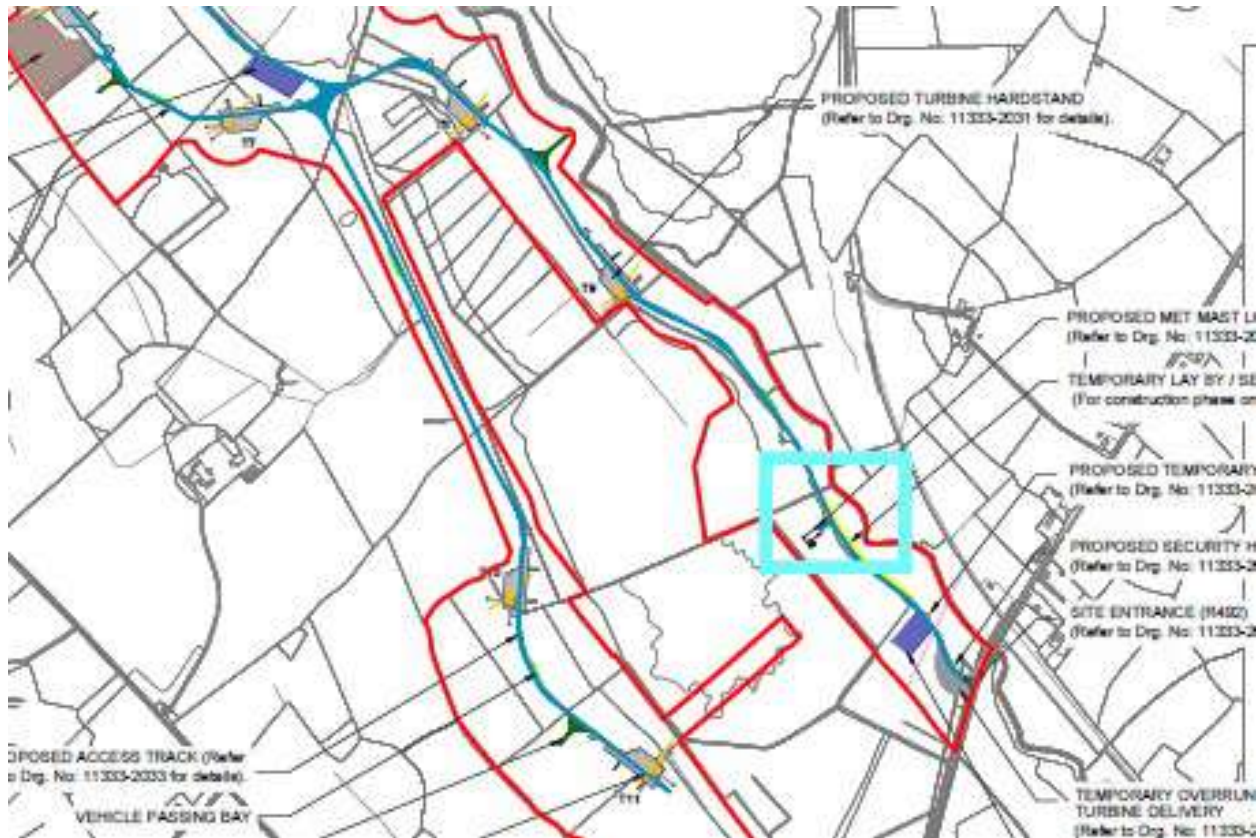
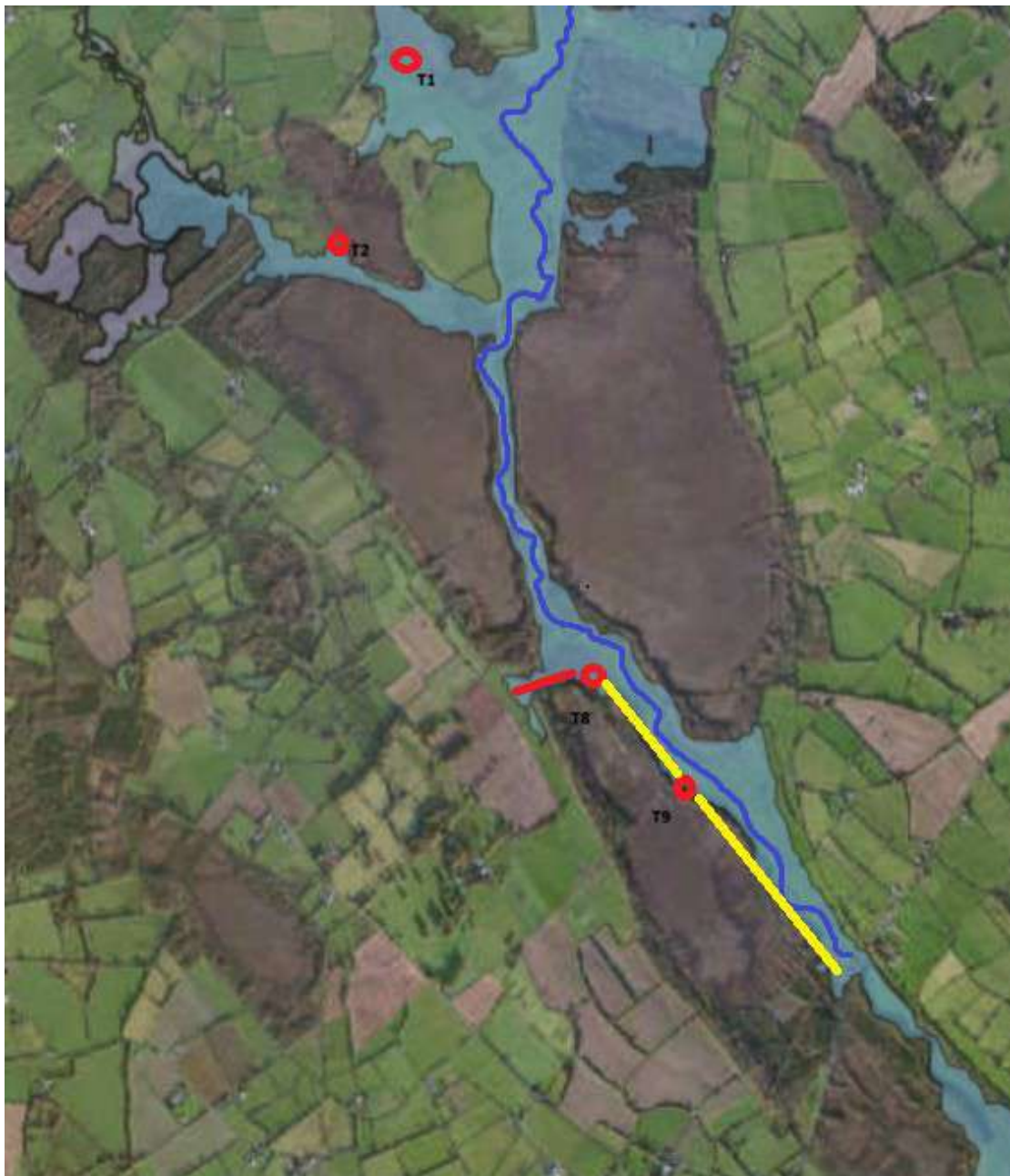


Figure 3.3 below shows the access tracks, and T1,T8, T9 in the flood plain and T2 in very close proximity in regular flooding activity

Figure 3.3 Flood Plain and proposed Infrastructure



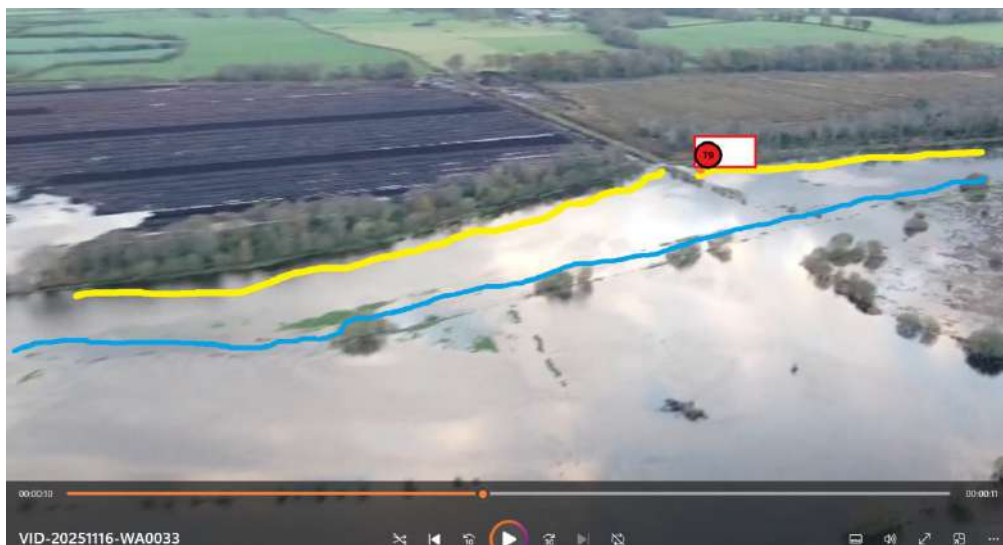
3.2.1 WHAT these maps look like in the real world – November to March

Images below are taken from Aerial footage captured in November 2025. The images mirror the Access tracks blue box identified in Site map above and follow the river/Access tracks from Site access near Sharavogue Bridge to T8. This is a real-world view of the floodplain and hydrological connectivity. While the Submission and

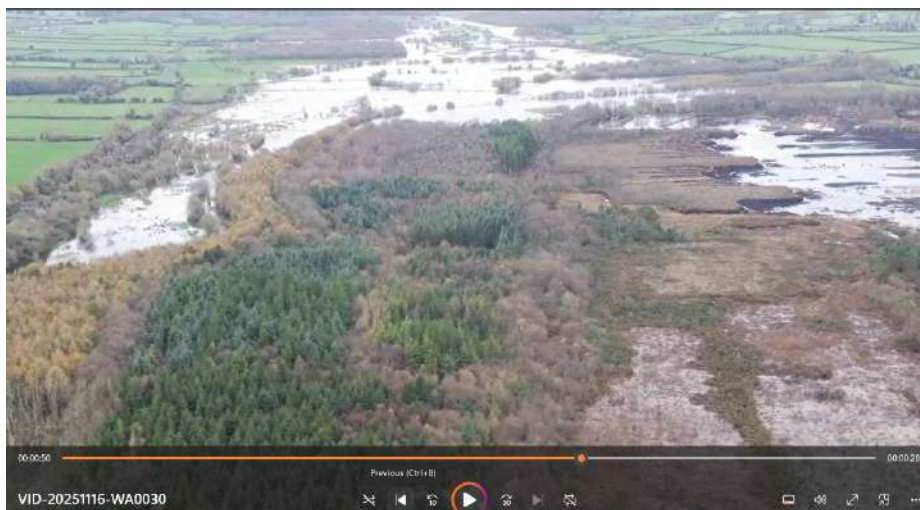
the CFRAM maps refer to 1in100/ 1in1000 year events this aerial footage represents the reality of the river from early November to late March **every** year. This river floods frequently across the year so this floodplain is very active but will flood extensively EVERY winter. The flood depths reach well beyond 1metre in places and any pedestrian access to the river is impossible for at least 5 months every year.

In the poorly edited images below BLUE represents the river and YELLOW represents the proposed access tracks. The images illustrate the negligible distance between river and access track, that both sides of the river are inextricably linked and the corresponding hydrological connectivity above ground level and may explain in real terms why there are no trial pits or Boreholes in this area across any of the Applicants maps.









Finally and perhaps most crucially it is evident that the river functions not as a barrier between the construction zone and the SAC but as a conduit. This is further corroborated by Dr Bartley who presents the GSI maps which show the subsoil on both banks of the Little Brosna as the same material — “Cut over raised peat”. This confirms that the river hydrologically links identical subsurface systems on either side, binding the development lands and Sharavogue Bog SAC into one connected unit (Hydro-G Report, Appendix 3-1, S1, S4.4). See below, extracted from Hydro G Report Appendix 3-1.

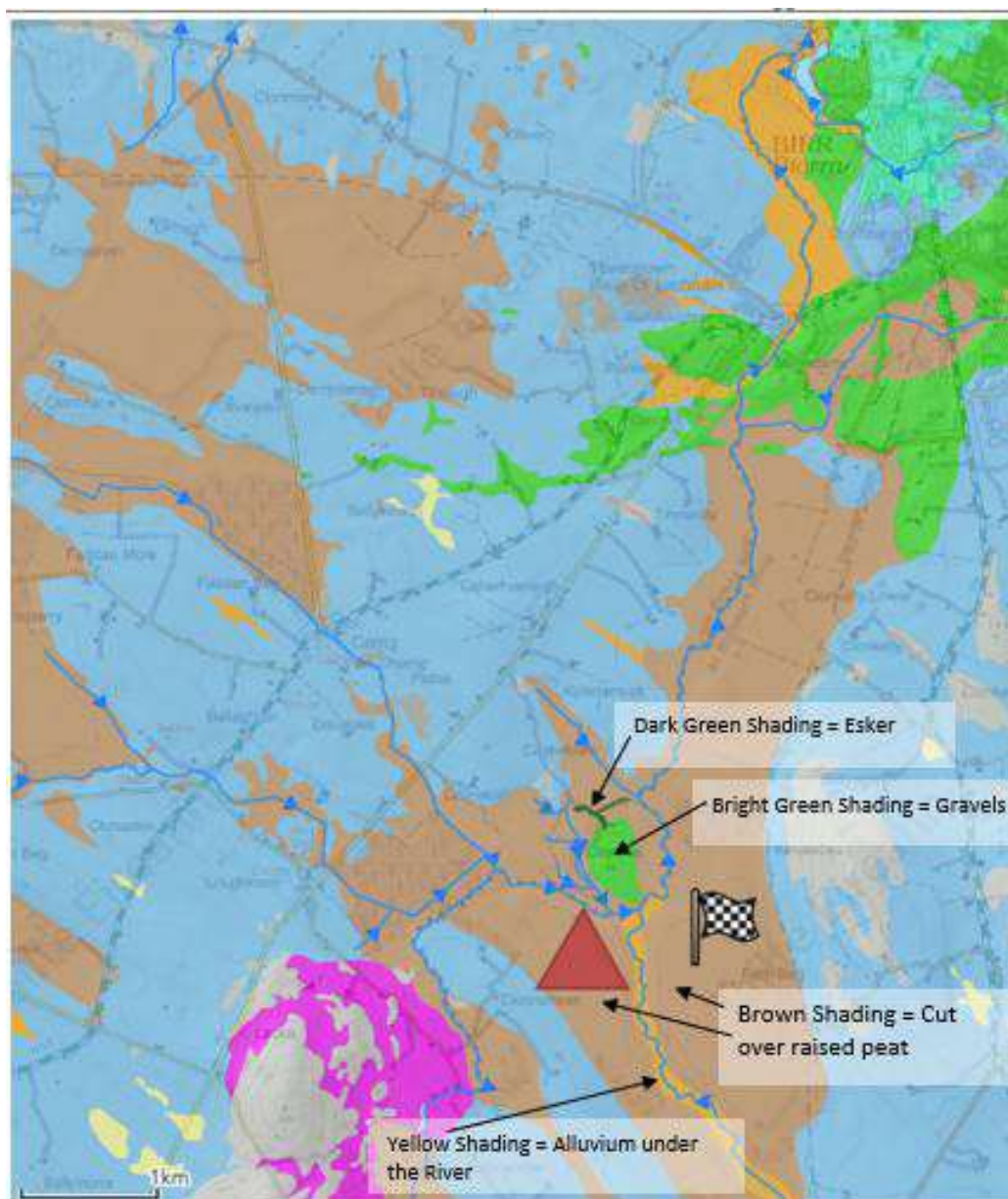


Plate A GSI Subsoil Mapping for the general area with Hydro-G annotations : On the west side of the LittleBrosna River the general centre of the proposed application area is shown by Hydro-G with a Red Triangle and on the east side of the river the Sharavogue Bog is shown with a Checkered Flag.

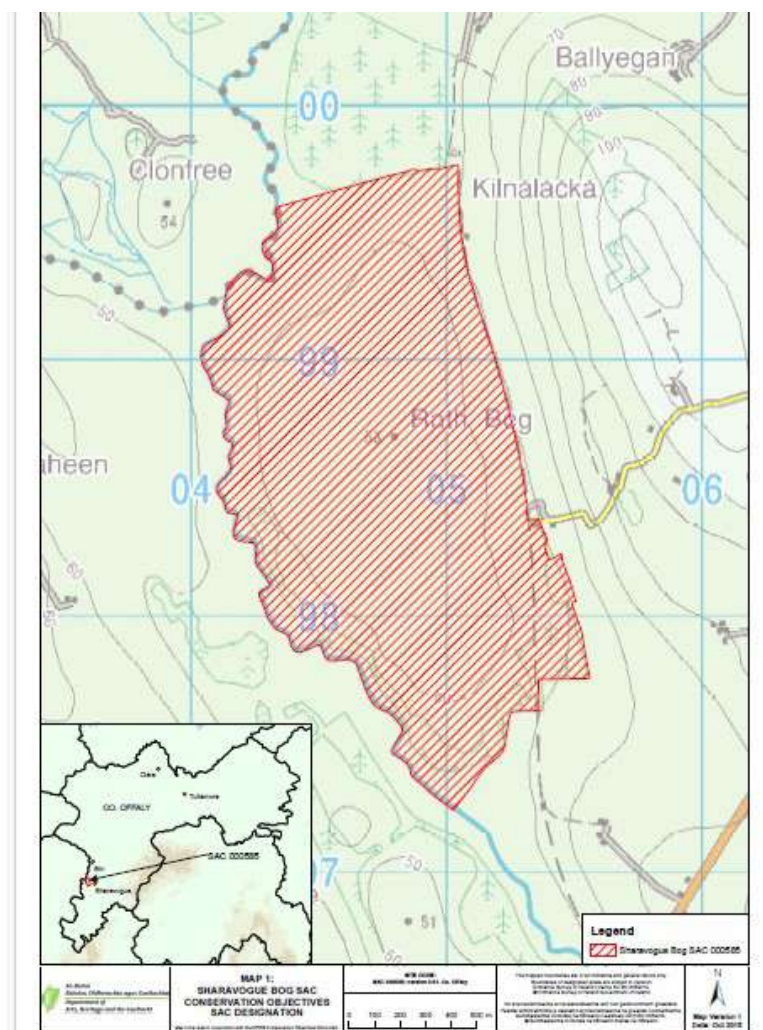
The scale of catchment alteration is itself substantial. The proposal entails 9.7 km of internal access roads widened to a 5.5 m clearance — approximately 5.3 ha of altered catchment — together with eleven excavated crane hardstandings of approximately 7 ha, giving on the order of 12 ha of cut-over peat stripped and compressed on one bank of a river hydraulically connected to the SAC (Hydro-G Report, Appendix 3-1, S2). To this is added 12.23 km of grid trenching, 17 joint bays, three borrow pits, a peat deposition area, 90 BESS container units, 7.2 ha of tree felling and 1.1 km of hedgerow

removal. The areal extent of catchment alteration on a connected floodplain is not quantified as a hydrological pressure anywhere in the applicant's own assessment.

3.2.2 Sharavogue Bog SAC

Figure 3.4 below shows the relationship between Sharavogue Bog SAC (site code 000585) and the River Brosna. Sharavogue Bog sits immediately east of the wind farm site, with its western boundary defined by the River Little Brosna — the same watercourse that forms the eastern boundary of the development. As previously shown the Proposed development site will use the river as its eastern boundary so a direct overlap is presented. The SAC boundary is classified in the Applicants documents as less than 10 metres from the wind farm perimeter at its closest point, adjacent to T8 and T9.

Figure 3.4 Sharavogue Bog – River is Boundary



Sharavogue Bog SAC is one of the few remaining raised bogs in Ireland situated on a floodplain, a characteristic the NPWS identifies as an exceptional rarity.

Sharavogue Bog is one of the few remaining raised bogs in Ireland situated on a floodplain. This is a characteristic of exceptional rarity. The bog displays a well-developed dome of uncut peat which is long and relatively narrow, representative of the classic Atlantic raised bog form.

(extract Site Synopsis Dept of Arts, Heritage and the Gaeltacht, pg 1).

Active Raised Bog (Habitat 7110) carries priority status under the Habitats Directive, attracting the highest level of protection in EU law. The site is not in a stable or robust condition. Its survival is itself the result of a grassroots rescue: in 1990 two local farmers purchased the freehold to protect the bog from drainage and extraction, later entering a management agreement with the NPWS, supported over decades by Dutch academic conservation effort (Hydro-G Report, Appendix 3-1, S4.2). A restoration programme completed in 2021 installed over 400 rewetting dams and blocked 26.4 km of drains — 90% of those identified as requisite — expanding Active Raised Bog toward a target of over 40 ha across the full 223 ha extent of the bog. The site is at its most hydrologically sensitive phase, with water tables higher than at any previous point in the restoration programme and peat-forming conditions being actively re-established.

This is the context in which the present application falls to be assessed. Any disruption to the hydrology of the interface zone does not merely affect the bog as it exists today, it threatens the trajectory of a decades-long, State-funded restoration programme.

The ecological significance of the site is concentrated in its lagg zone — a fringe of upwelling base-rich groundwater along the eastern margin supporting carr woodland and calcareous fen vegetation. The NPWS records this as one of the best developed lagg systems in the country and unique in the context of Irish raised bogs. Areas of wet lagg vegetation of this character are described as very rare in Western Europe. It is the primary element of local distinctiveness formally recognised for the site. The lagg

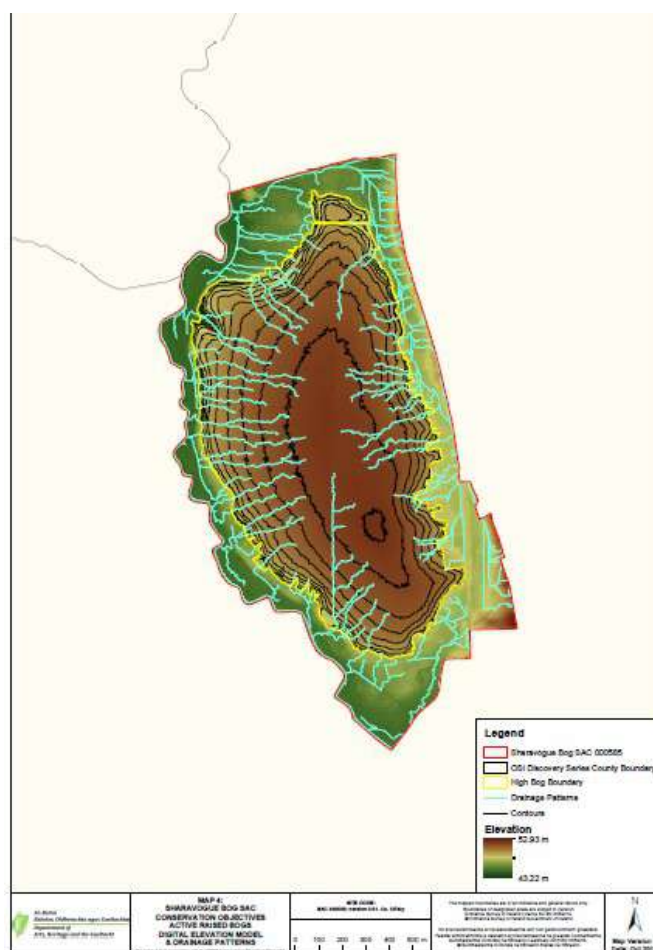
is inherently sensitive to external hydrological disturbance because it depends entirely on the interaction between groundwater, surface water, and adjacent land use.

Within the lagg, *Slender Cottongrass* (*Eriophorum gracile*), a species protected under the Flora (Protection) Order 2015, has been recorded in the Applicants documents, a species that occurs only where a stable base-rich water supply is maintained.

Atmospheric nitrogen deposition at the site already stands at approximately 13.2 kg N/ha/yr against a conservation target of no more than 5 kg N/ha/yr — an existing exceedance of 163% above the upper critical load threshold, leaving no margin for any additional loading.

The River Little Brosna does not function as a buffer between the construction zone and Sharavogue Bog. The river forms the boundary on the Western side and acts as a conduit as illustrated below in Figure 3.5.

Figure 3.5 Sharavogue Bog Hydrological Connectivity



The applicant acknowledges the hydrological connectivity in the NIS in two separate references ;

1. Table 6-1 (p.118) identifies hydrological connectivity to the SAC via the Little Brosna_040 and drainage ditches. Further the documents record a groundwater pathway via the Shinrone groundwater body.
2. NIS (Pg 56) *"The Little Brosna_040 RWB is located within the Sharavogue Bog SAC (000585). The proposed project is hydrologically connected to the Sharavogue Bog SAC via drainage ditches and the Little Brosna_040 RWB."*

The applicant's EIAR (Ch.9, p.9-34) records calcareous fen upwelling at the eastern margin of the wind farm site, the direct interface with the SAC, physical evidence that the near-surface groundwater system is active and connected across that boundary. How the NIS then handles — or fails to handle — these acknowledged connections is addressed in Ground X below.

Beyond its conservation designation, the active raised bog at Sharavogue functions as a carbon store and active carbon sink. Peatland restoration forms part of Ireland's land-use carbon accounting under the EU Climate Law (Regulation (EU) 2021/1119) and the LULUCF Regulation (Regulation (EU) 2018/841, as amended by Regulation (EU) 2023/839), and is relied upon in the national Climate Action Plan to meet binding emissions-reduction commitments. The independent literature in Appendix 3-2 reinforces the point: degraded Irish raised bogs are now net CO₂ emitters, with peat extraction approximately 70% more extensive than the National Inventory reports (Habib et al., 2024, Hydro-G Report, Appendix 3-2), and the maintenance and restoration of intact peatland hydrology is identified as the single most important action for carbon and water security (Locke et al., 2026, Appendix 3-2)

The restoration programme now underway is intended to return the site from a degraded, carbon-emitting state to net sequestration. This is not merely a site-level conservation matter. Excavation of between 59,000 and 87,600 m³ of peat, together with drainage modification and water-table drawdown across a bog in active rewetting would re-expose stored carbon to oxidation and reverse the sequestration gains the

State has invested in. The application contains no carbon-loss assessment and no quantification of the emissions consequences of disturbing this peat body. A development that undermines a State-funded carbon sink, in direct tension with Ireland's statutory climate obligations, cannot be assessed as though the only receptor at risk were the habitat in isolation.

Source: NPWS Site Synopsis); NPWS Conservation Objectives (2015); NPWS Conservation Measures (2025); NIS Section 6.1, p.117; NIS Table 6-1, p.118; EIAR Ch.9, Table 9-13, p.9-35; EIAR Ch.9, p.9-34; Appendix 9-1, p.22

3.2.3 Multiple tributaries cross the site.

The Wingfield 25 and Faddan Beg streams converge and flow into the Holy Well Clohaskin River, which meets the Little Brosna at the site's northeast corner. The Pallas Kylenamuck stream, a first-order watercourse, traverses the northeast of the site before discharging to the Little Brosna approximately 25 metres downstream of the survey point (Appendix 9-1, p.7). Fourteen internal drain crossings are proposed, mostly peat drains, along with a crossing of the Holy Well Clohaskin River between T2 and T3.

Figure 3.6 Tributary Network on the Proposed Site



Purple hubs represent T1-t11

3.2.4 The downstream European sites

The Little Brosna and its tributaries are hydrologically connected to six European sites protected under the Habitats Directive and Birds Directive. The NIS (Section 6.1, p.117) acknowledges that, in the absence of mitigation, indirect adverse effects on all six from water quality degradation cannot be excluded:

- Sharavogue Bog SAC (Site Code 000585) — a Priority Habitat raised bog, SAC boundary 10 metres from the wind farm site, in active restoration following installation of over 400 rewetting dams in 2021
- River Shannon Callows SAC
- River Little Brosna Callows SPA (004086)
- Middle Shannon Callows SPA (004096)

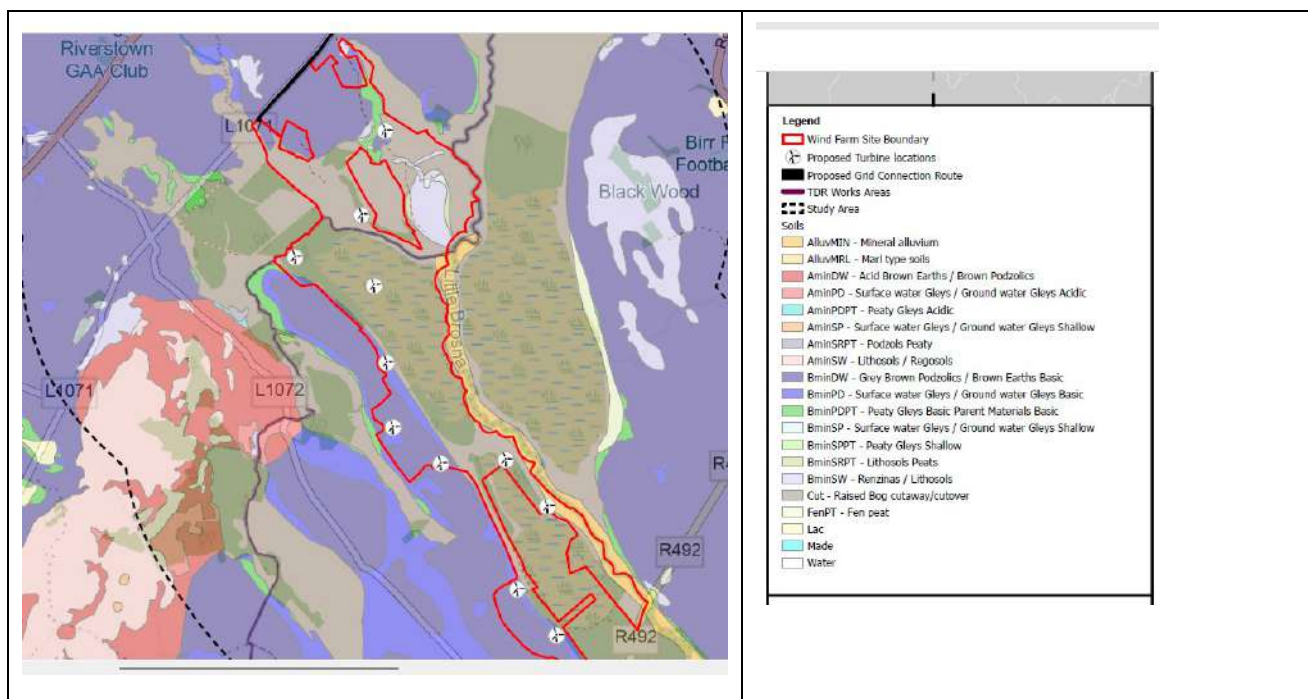
- Dovegrove Callows SPA
- Lough Derg (Shannon) SPA

Source: NIS Section 6.1, p.117; NIS Table 5-1, p.87; Appendix 9-1, p.22

3.2.5 The Flood Context

SI soil survey mapping presented above shows a continuous belt of AlluvMIN (mineral alluvium) flanking the Little Brosna corridor — an extensive active and historic floodplain with direct river connectivity. Source: FRA App.9-3, pp.11–15; OPW floodinfo.ie; GSI Soils Map

Figure 3.7 Soil Survey Map (RWE application)



An analysis of this map suggests :

1. **Floodplain extent:** The width of the AlluvMIN belt indicates a significant active floodplain. The Little Brosna is a major tributary of the Shannon and is known to flood extensively — this is consistent with the broad alluvial deposits shown. Any infrastructure within or crossing this zone is at direct flood risk, and works could alter flood conveyance upstream and downstream.
2. **Floodplain connectivity:** The alluvial soils indicate the river maintains strong lateral connectivity with its floodplain. This is ecologically and hydrologically critical — it supports nutrient cycling, fish spawning habitat, and natural flood attenuation. Construction disturbance here could disrupt this connectivity permanently.
3. **Surface water drainage:** The prevalence of gley soils across the wider site (BminPD, BminSP, AminPD, AminSPPT categories) indicates widespread poor drainage and high water tables across the site generally — not just near the river. This means construction-phase runoff will be difficult to manage, with high silt and sediment risk to the Little Brosna.
4. **Peat and cutover bog:** The Cut (raised bog cutaway/cutover) and FenPT categories visible on the wider map indicate peat and modified bog soils. Disturbed peat is one of the most serious hydrological risks in wind farm construction — it can liquefy, generate acidic and discoloured runoff, and block watercourses.

The applicant's Flood Risk Assessment (Appendix 9-3) establishes that T1, T2, T8 and T9 and large parts of the access tracks lie within Flood Zone A or B. The High Probability / **Flood Zone A** designation is more typical for this area — the lived experience of farmers with adjoining lands unable to access lands near the river from November to March every year, yet the applicant defaults to a Medium probability / *Flood Zone B* analysis using the Mid-Range Future Scenario, and at no point engages the +30% High-End Future Scenario. The probability of annual exceedance is presented in the Applicants Table 2.1 below.

Table 2.1: Decision Matrix for Determining the Appropriateness of a Development

Flood Zone: (Probability)	Annual Exceedance Probability (AEP)	Highly Vulnerable	Less Vulnerable	Water Compatible
A (High)	<u>Coastal Flooding</u> More frequent than 0.5% AEP	Justification Test Required	Justification Test Required	Appropriate
	<u>Fluvial & Pluvial Flooding</u> More frequent than 1% AEP			
B (Medium)	<u>Coastal Flooding</u> 0.1% to 0.5% to AEP	Justification Test Required	Appropriate	Appropriate
	<u>Fluvial & Pluvial Flooding</u> 0.1% to 1% AEP			
C (Low)	<u>Fluvial, Pluvial & Coastal Flooding</u> Less frequent than 0.1% AEP	Appropriate	Appropriate	Appropriate

On the applicant's own data, under the existing 1-in-100-year (1% AEP) event T9 is 50% inundated and T1 25% inundated; under the Mid-Range Future Scenario (+20% peak flows for climate change), T9 rises to 75% and T1 to 40%. The site access track from the R492 along the river corridor is fully submerged under MRFS conditions, and access tracks to T1 and T2 are also inundated. This analysis is supported by the Applicant's Appendix 9-3 which maps the fluvial flood activity and shows the impact for T1, T2, T8 T9 and access tracks throughout the site.

Figure 3.8 CFRAM MRFS Fluvial Flood Extents T 8 &



Figure 3-9: CFRAM MRFS Fluvial Flood Extents - Turbines 8 & 9

T9

Figure 3.9 CFRAM MRFS Fluvial Flood Extents T 1 & T2

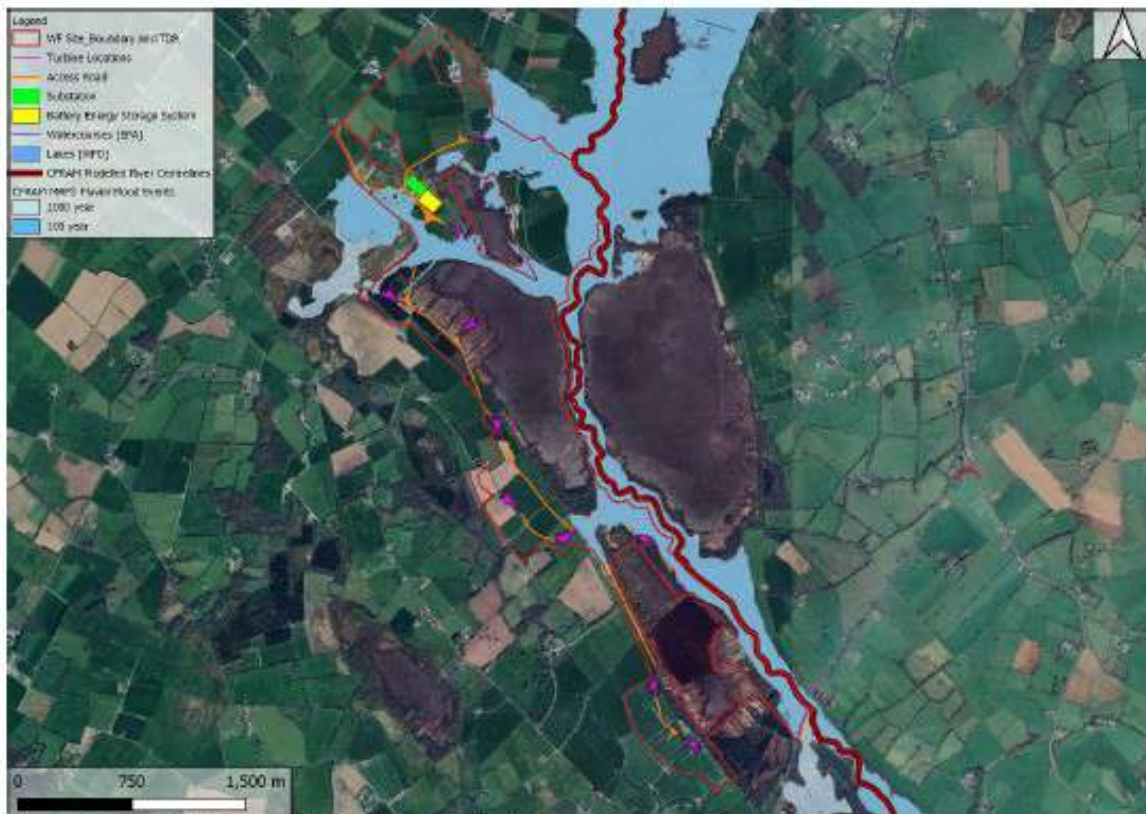


Figure 3-7: CFRAM MRFS Fluvial Flood Extents

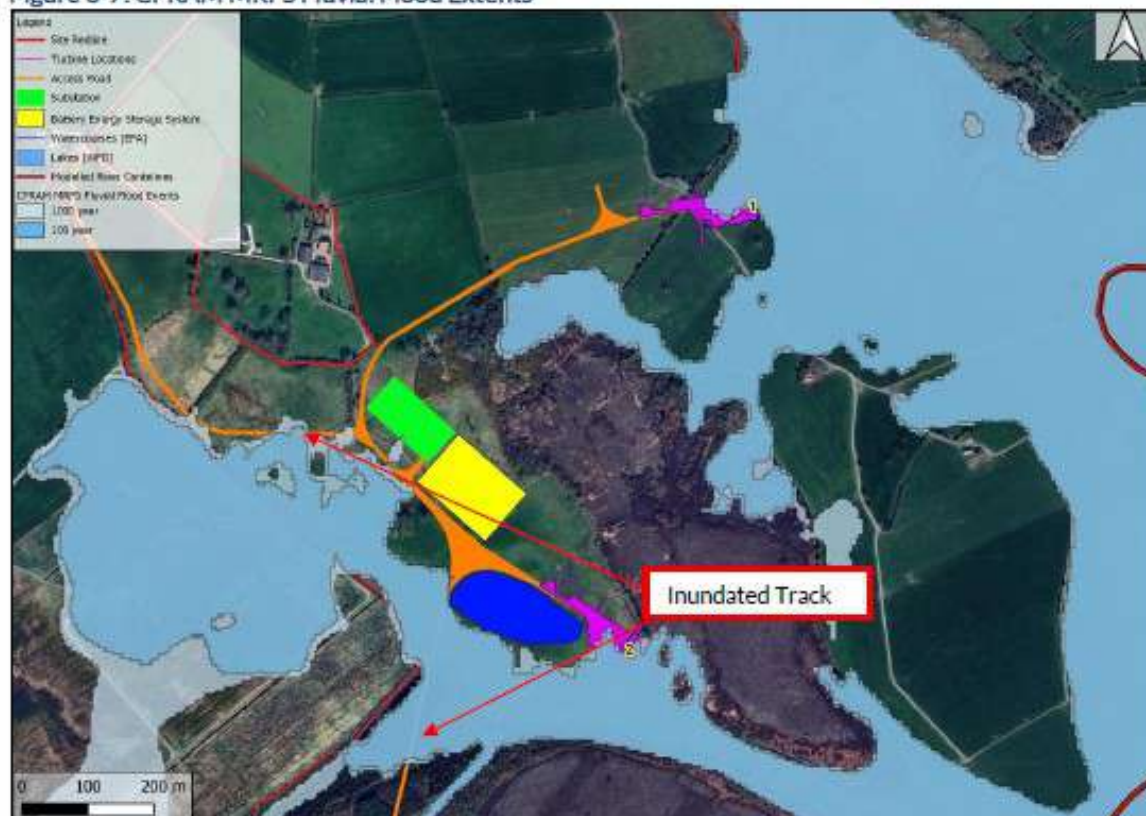


Figure 3-8: CFRAM MRFS Fluvial Flood Extents - Turbines 1 & 2

Two aspects to the Applicants submission are notable.

Existing Conditions (current CFRAM baseline)

Data App 9-3, Page 17

Turbine 1% AEP (1-in-100yr) 0.1% AEP (1-in-1000yr)

T1	25%	~35%
T2	5%	~25%
T8	5%	slightly larger
T9	50%	slightly larger

Mid-Range Future Scenario (MRFS, +20% peak flows for climate change)

Data: App 9-3, Page 18

Turbine 1% AEP (1-in-100yr) 0.1% AEP (1-in-1000yr)

T1	40%	slightly larger
T2	25%	slightly larger
T8	15%	slightly larger
T9	75%	slightly larger

The MRFS applies a +20% uplift to peak flows to model the effect of climate change over the lifetime of the wind farm. The data shows that because the Little Brosna floodplain is flat, even a modest increase in peak flow translates to a significant expansion of the flood extent hence T9 jumping from 50% to 75% inundated at the same 1% AEP event. Further, note in an expanded Figure 3.6 below where and how the extended flooding travels. It moves closer to the SAC on the East side. Also note that the high end “+30% High end future scenario” although more likely in Flood Zone A is never engaged and in that scenario the water will travel closer again towards the SAC.

Figure 3.10 Magnified : CFRAM MRFS Fluvial Flood Extents T 8 & T9

This tendency to flood to the East and approaching the heavily protected Sharavogue Bog SAC (which the Applicant claims less than 10m from the boundary of the development) must be noted and becomes critical across many aspects discussed across this and subsequent chapters.

3.2.6 The WFD baseline

The WFD Compliance Assessment (Appendix 9-1, Table 2-2 see below) records the Little Brosna_040 sub-basin — which contains all nine turbines, the GCR and TDR — as having deteriorated from Moderate (2016–2021) to **Poor** for the 2019–2024 monitoring cycle, with an At Risk designation.

Table 2-2 Water River Body Status in the study area

Catchment	Sub-Catchment	River Sub-Basins (RWB_CD)	Waterbody Name	EPA Name	WFD Status 2016-2021	WFD Status 2019-2024	Risk	Application Site within WFD subbasin
Lower Shannon 25B	Little Brosna_SC_020	IE_SH_25L020600	Little Brosna_030	Aghadoulas 25 Glasderry Beg Little Brosna	Good	Good	Not at Risk	T10, T11
		IE_SH_25L020700	Little Brosna_040	Arragh Beg Arragh More Faddan More Faddan Beg Holy Well Clohaskin Kylenamuck Little Brosna Loughkeen North Cloonaheen Pallas 25 Pallas Kylenamuck Rath Beg Rock [Birr] Wingfield 25	Moderate	Poor	At Risk	T1-T9, GCR, TDR
	Shannon [Lower]_SC_060	IE_SH_25L020800	Little Brosna_050	Camcor Little Brosna Unknown	Good	Moderate	At Risk	GCR
		IE_SH_25L021000	Little Brosna_060	Little Brosna Ross 25 Tullynisk Woodfield 25	Good	Moderate	Not at Risk	GCR
		IE_SH_25I020930	Incherky_010	Cloghan 25	Unassigned	Good	Review	N/A

The most recent Q-value at Riverstown Bridge (RS25L020700) was Q3 (Poor) in 2023. Appendix 9-1 (WFD Assessment), Table 2-1, p.8

Dr Pamela Bartley's expert review confirms the same EPA position: Little Brosna_040 (IE_SH_25L020700) at Poor status (2019–2024), 3rd-cycle At Risk, with significant pressures listed as Agriculture, Hydromorphology, and Peat Extraction and Drainage — the very pressure category this development would add (Hydro-G Report, Appendix 3-1, S4.1).

This *Poor* classification is separately corroborated by the applicant's own aquatic ecology survey data, which records several **on-site watercourses** as Poor and one location as Bad and seriously polluted. This will be discussed at length later.

3.2.8 Biological Water Quality

The Q-ratings and the ecological status derived from the diversity and relative abundance of the macroinvertebrates at detailed survey sites (i.e. Sites 1, 3, 10 and 11) are given in Table 3-4.

The macroinvertebrate communities recorded at survey sites comprised of a range of macroinvertebrate taxa. Of the four sites sampled, the target of Q4 unpolluted water was not achieved at any of the sampling sites. Site 1 received a Q3-Q4 status, slightly polluted water. Sites 3 and 10 received a Q3 status of moderately polluted water due to the paucity of pollution sensitive taxa, as well as the degree of siltation (considerable) and algal growth (luxuriant). Site 11 received a Q2 status, a site dominated by Group D taxa.

The current survey results indicate that the overall biological water quality in the watercourses draining the proposed wind farm site is poor and moderately polluted. The sampled watercourses do not provide water of a quality adequate to support a range of pollution sensitive mayfly and stonefly larvae, as well as salmonids.

Table 3-4: Biological Water Quality and Interpretations at Study Sites on Watercourses Draining the proposed project.

Site	Q-value	WFD Ecological Status
1	3-4	Moderate status (Slightly Polluted)
3	3	Poor status (Moderately Polluted)
10	3	Poor status (Moderately Polluted)
11	2	Bad status (Seriously Polluted)

3.2.7 The Little Brosna Area for Action

Under Ireland's Water Framework Directive (WFD) governance, Areas for Action (AFAs) are catchments selected for targeted, prioritised intervention where improvements in water quality are considered achievable and where an ongoing presence is required — not just to achieve improvements but to maintain them over the longer term. The core objectives are to prevent deterioration by ensuring that the quality of all waterbodies does not decline and achieve good status by bringing all waters up to "Good" ecological and chemical conditions. They are not passive designations; they carry active resource commitments and multi-agency coordination obligations. AFA designation reflects the EPA's judgement that it is both impacted and potentially recoverable with targeted action.

The proposed wind farm falls entirely within the Little Brosna WFD Area for Action (AFA), designated under the River Basin Management Plan Cycle 2 (2018–2021) and continuing under the Water Action Plan 2024 as an Area for Restoration.

The Hydro-G review confirms the AFA is a LAWPRO-led restoration programme covering 11 waterbodies, established precisely to address the pressures - nutrients, peat workings, hydromorphology, driving Poor status in this catchment (Hydro-G Report, Appendix 3-1, S4.1). Construction on peat, road-building, turbine foundations, cable trenching and drainage alteration, directly replicates and compounds the same

pressure categories already driving this water body's failure. This designation is not historical context; concrete restoration activity is already underway in the wider peat landscape.

3.3 The Legal Framework

3.3.1 Water Framework Directive (Directive 2000/60/EC)

Article 4(1)(a) of the WFD imposes three obligations relevant to this application: to prevent deterioration of surface water status; to protect, enhance and restore waterbodies toward good status; and to implement the programme of measures established under the River Basin Management Plan.

The CJEU interpreted the scope of these obligations definitively in Case C-461/13 (*Weser*, 2015). The Court held that the obligation to prevent deterioration is binding; that authorisation must be refused where a project is liable to cause deterioration of status; and that deterioration occurs as soon as the status of at least one quality element falls by one class. Where the quality element is already at the lowest class, any further deterioration constitutes a breach of the non-deterioration obligation.

Poor status is the second-lowest WFD classification, one step above Bad. The legal consequence is absolute: any construction-phase reduction in any biological, physico-chemical or hydromorphological quality element is prohibited, regardless of overall class change and regardless of whether it is temporary. This is not a balancing exercise. The applicant has waived Article 4.7. There is no flexibility.

3.3.2 The Habitats Directive (Directive 92/43/EEC)

Article 6(3) requires that any plan or project likely to have a significant effect on a European site must undergo Appropriate Assessment. The competent authority may only agree to the plan or project after ascertaining that it will not adversely affect the integrity of the site.

The standard of certainty is unequivocal. In Case C-127/02 (*Waddenvereniging*, 2004), the CJEU held that authorisation may only be given if the competent authority is certain beyond all reasonable scientific doubt that the project will not adversely affect site integrity. In Case C-258/11 (*Sweetman*, 2013), the Court confirmed that a project adversely affects integrity if it is liable to prevent the lasting preservation of the

constitutive characteristics of the site. In Case C-461/17 (*Holohan*, 2018), the Court confirmed that the assessment must contain complete, precise and definitive findings free of lacunae. In Case C-323/17 (*People Over Wind*, 2018), the Court confirmed that mitigation measures must be assessed in full in the NIS itself, not assumed to work. Article 6(4) derogation is expressly not relied upon by the applicant (NIS, p.4). Article 4.7 WFD derogation is expressly not relied upon (Appendix 9-1, p.28). Full compliance must be demonstrated on the basis of the application as submitted.

3.4 Ground 1 — WFD Poor Status Baseline and the Weser Prohibition

3.4.1 The Wrong Baseline

The entire hydrological impact assessment in EIAR Chapter 9 was conducted against the wrong WFD classification. Table 3.1 below shows the different interpretation of the data as presented in the Application. This is not a matter of interpretation — it is a factual discrepancy between two documents filed as part of the same application.

Table 3.1 Cross Comparison of Application WFD Assessment Tables

Table 9-5

EIAR Chapter 9, p.9-15

(Waterbodies within study area)

River network (segment code)	WFD status 2019–2024	WFD risk 2019–2024
Catchment: Lower Shannon 25B Sub-catchment: Little Brosna_SC_020		
Little Brosna (25_3572)	Moderate	At risk
Little Brosna (25_13147)	Moderate	At risk
Pallas Kylenamuck (25_634)	Moderate	At risk
Pallas 25 (25_3279) (25_3772) (25_739) (25_3692)	Moderate	At risk
Holy Well Clohaskin (25_3277) (25_3276) (25_21)	Moderate	At risk
Rath Beg	Moderate	At risk

Table 2-2

WFD Assessment, Appendix 9-1, p.10

(Water river body status in the study area)

Waterbody name (RWB_CD)	WFD status 2016– 2021	WFD status 2019– 2024	Risk 2019– 2024
Catchment: Lower Shannon 25B Sub-catchment: Little Brosna_SC_020 Turbines: T1–T9, GCR, TDR			
Little Brosna_030 (IE_SH_25L020600)	Good	Good	Not at risk
Little Brosna_040 (IE_SH_25L020700) <i>Includes: Faddan Beg, Holy Well Clohaskin, Wingfield 25, Pallas Kylenamuck, N. Cloonahen...</i>	Mod	POOR	At risk
Little Brosna_050 (IE_SH_25L020800)	Good	Mod	At risk
Little Brosna_060 (IE_SH_25L021000)	Good	Mod	Not at risk

(25_3278)		
North Cloonaheen (25_20)	Moderate	At risk
Faddan Beg (25_3669)	Moderate	At risk
Wingfield 25 (25_1084)	Moderate	At risk

The two tables above are both filed as part of the same application yet record materially different WFD ecological status classifications for the same receiving waterbody. Dr Bartley's independent review identifies the same contradiction as the central WFD defect.

Table 9-5 in EIAR Chapter 9 (p.9-15) presents all waterbodies within the wind farm study area under a single grouped entry for the Little Brosna_SC_020 sub-catchment, carrying a **WFD status of Moderate and a risk designation of At Risk**. This grouped entry includes, by name, every tributary that will directly receive construction runoff from the turbine foundations and access tracks: the Holy Well Clohaskin River, Faddan Beg, Wingfield 25, Pallas Kylenamuck and North Cloonaheen streams. The Moderate status assigned in Table 9-5 is accordingly the de facto WFD baseline against which Chapter 9 of the EIAR assesses construction-phase water quality impacts for all of those watercourses.

When Table 2-2 in the WFD Compliance Assessment (Appendix 9-1, p.10), disaggregates the same sub-catchment into its component sub-basins it records a materially different classification.

Table 2-2 Water River Body Status in the study area

Catchment	Sub-Catchment	River Sub-Basins (RWB_CD)	Waterbody Name	EPA Name	WFD Status 2016-2021	WFD Status 2019-2024	Risk	Application Site within WFD subbasin
Lower Shannon 25B	Little Brosna SC 02C	IE_SH_25L020600	Little Brosna_030	Aghadoulas 25 Glasderry Beg Little Brosna	Good	Good	Not at Risk	T10, T11
		IE_SH_25L020700	Little Brosna_040	Arragh Beg Arragh More Faddan More Faddan Beg Holy Well Clohaskin Kylenamuck Little Brosna Loughkeen North Cloonaheen Pallas 25 Pallas Kylenamuck Rath Beg Rock (Bir) Wingfield 25	Moderate	Poor	At Risk	T1-T9, GCR, TOR
	Shannon Lower SC 06D	IE_SH_25L020800	Little Brosna_050	Canacor Little Brosna Unknown	Good	Moderate	At Risk	GCR
		IE_SH_25L021000	Little Brosna_060	Little Brosna Ross 25 Tullynisk Woodfield 25	Good	Moderate	Not at Risk	GCR
		IE_SH_25L020930	Incheriky_010	Cloghan 25	Unassigned	Good	Review	N/A

The excerpt below is taken from Section 9.3.2.3 Surface Water Quality page 9-22

The rivers and tributaries, associated with the proposed wind farm site and proposed GCR have been reviewed in terms of their respective WFD Status 2019-2024. The Little Brosna_030, the Little Brosna_040 and the Little Brosna_050 are classified as having moderate status. The Little Brosna_060 is classified as having good status.

The windfarm development falls within the **Little Brosna_040** sub-basin and contains Turbines: T1–T9, GCR, TDR as recognised in Table 2-2 WFD Assessment, (Appendix 9-1, p.10) and which includes as named constituent waters the Holy Well Clohaskin, Faddan Beg, Wingfield 25, Pallas Kylenamuck and North Cloonaheen streams — is recorded in Table 2-2 as **deteriorating from Moderate (2016–2021) to Poor (2019–2024)**, with an At Risk designation. This Poor status classification is corroborated by the Q3 (Poor) value recorded at Riverstown Bridge (RS25L020700) in 2023, the most recent biological survey data at the monitoring station closest to the proposed development within that sub-basin.

The selection of the aggregated "Moderate" classification over the applicant's own "Poor" sub-basin figure operates to mask the true status of the receiving environment. Whether by design or by omission the result is the same: the assessment is built on a baseline the applicant's own documents contradict. As Dr Bartley puts it, the Inspector cannot resolve the inconsistency by preferring Chapter 9 over Appendix 9-1, because Appendix 9-1 is the specialist document and Table 2-2 is the correct disaggregated classification (Hydro-G Report, Appendix 3-1).

3.2.8 Biological Water Quality

The Q-ratings and the ecological status derived from the diversity and relative abundance of the macroinvertebrates at detailed survey sites (i.e. Sites 1, 3, 10 and 11) are given in Table 3-4.

The macroinvertebrate communities recorded at survey sites comprised of a range of macroinvertebrate taxa. Of the four sites sampled, the target of Q4 unpolluted water was not achieved at any of the sampling sites. Site 1 received a Q3-Q4 status, slightly polluted water. Sites 3 and 10 received a Q3 status of moderately polluted water due to the paucity of pollution sensitive taxa, as well as the degree of siltation (considerable) and algal growth (luxuriant). Site 11 received a Q2 status, a site dominated by Group D taxa.

The current survey results indicate that the overall biological water quality in the watercourses draining the proposed wind farm site is poor and moderately polluted. The sampled watercourses do not provide water of a quality adequate to support a range of pollution sensitive mayfly and stonefly larvae, as well as salmonids.

Table 3-4: Biological Water Quality and Interpretations at Study Sites on Watercourses Draining the proposed project.

Site	Q-value	WFD Ecological Status
1	3-4	Moderate status (Slightly Polluted)
3	3	Poor status (Moderately Polluted)
10	3	Poor status (Moderately Polluted)
11	2	Bad status (Seriously Polluted)

Site 11, the Pallas Kyleneamuck stream (EPA Code 25P56), is recorded as **Bad status, Seriously Polluted**. It is a first-order stream that runs through the northeast of the wind farm site and joins the Little Brosna River approximately 25 metres from the survey point (Appendix 6-3, Section 3.2.3.11, p.22).

The consequence of this discrepancy is specific and significant. Chapter 9 of the EIAR, the chapter that assesses hydrological impacts, characterises the receiving environment and evaluates the adequacy of the proposed Surface Water Management Plan — **applies a *Moderate* baseline to every construction-phase receiving tributary**, because Table 9-5 presents them all as Moderate. We have established that this grouped entry is a false classification. The legal standard that applies under CJEU Case C-461/13 (Weser, 2015) is determined by the **actual** classification of the waterbody, not the classification presented in any particular chapter of the EIAR. The Little Brosna_040 is at Poor status. The impact assessment in Chapter 9 has been conducted against a baseline One classification level more favourable than the figure in the applicant's own WFD Assessment.

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3.4.2 Material consequence for WFD compliance

The entire WFD impact assessment in EIAR Chapter 9, and the adequacy conclusions drawn from the SWMP (Appendix 9-4), have been developed against a Moderate baseline rather than a Poor baseline.

App.9-1 The WFD Assessment **explicitly delegates its own impact and residual effects analysis back to Chapter 9**, stating its conclusions are "the residual effects identified in Chapter 9." Chapter 9 used the Moderate baseline. Therefore App.9-1's compliance conclusion is built entirely on Chapter 9's Moderate-baseline impact assessment. An impact assessment premised on the wrong baseline status cannot satisfy the Weser obligation (Hydro-G Report, Appendix 3-1, S4.1).

3.4.3 Legal consequence of Poor status

Under CJEU Case C-461/13 (*Bund für Umwelt und Naturschutz Deutschland v Bundesrepublik Deutschland*, the Weser judgment, 2015), the obligation to prevent deterioration of surface water status is binding on planning authorities. The Court held at paragraph 67 that deterioration occurs as soon as the status of at least one quality element falls by one class; and at paragraph 69 that, if the quality element concerned is already at the lowest class, any further deterioration of that element constitutes a deterioration of the waterbody's status. Poor status is the second-lowest WFD classification, one class above Bad. Any construction-phase reduction in any biological, physico-chemical or hydromorphological quality element — including a temporary reduction — is therefore legally prohibited.

This is not a balancing exercise. As noted above, the applicant has waived the Article 4.7 derogation. Compliance with the baseline non-deterioration obligation must be demonstrated in full.

Source: CJEU C-461/13 (Weser, 2015), paras 67–69; WFD Art.4(1)(a); S.I. No.272/2009

The compliance case has not been demonstrated in full on the application as submitted. It has been demonstrated against the wrong classification. That, on its own, is sufficient to refuse consent on this ground. The further failures in respect of the AFA

programme of measures, phosphorus and iron baselines, the Pallas Kylenamuck Q2 receptor, and the flood-condition mitigation, are addressed in the grounds that follow.

Source: EIAR Ch.9 p.9-15; Appendix 9-1, Table 2-1 p.8, Table 2-2 p.10, Stage 3 p.17, p.11, p.28; Appendix 6-3 S3.2.3.11 p.22; CJEU C-461/13 (Weser, 2015) paras 67, 69; WFD Art.4(1)(a)(i); S.I. No.272/2009; Hydro-G Report, Appendix 3-1, S4.1.

3.5 Ground 2 — The AFA Programme of Measures: A Legal Test Set-Up then Abandoned

The WFD imposes two distinct obligations on the consenting authority, both at Article 4(1)(a). The first, addressed in Ground 1, is non-deterioration of waterbody status. The second is implementation of the programme of measures established under the River Basin Management Plan (Article 4(1)(a)(iii)). The two obligations must not be conflated. The first asks whether the project will cause harm. The second asks whether the project is consistent with the active restoration programme Ireland has already committed to for this catchment. The applicant's WFD Assessment correctly identifies the second test as applicable, recites every fact required to apply it, and then declines to complete it. That self-authored lacuna is the subject of this ground.

3.5.1 The Test Is Identified

Section 3.3 of Appendix 9-1, headed *"Assessment of Proposed Project Against Programme of Measures,"* opens by correctly identifying the test: to determine *"whether the proposed wind farm can support their implementation or if there is potential to hinder their delivery."*

Section 3.3 then sets out every relevant fact:

- The Little Brosna_040 is a designated AFA — an Area for Action under the River Basin Management Plan and continuing under the Water Action Plan 2024 as an Area for Restoration;
- The AFA is led by the Local Authority Waters Programme (LAWPRO) and covers eleven waterbodies;
- The significant pressures driving failure include peat workings and drainage (hydromorphology);
- Sharavogue Bog's restoration programme is active, with over 400 rewetting dams installed in 2021 and 26.4 km of drains blocked.

After setting out those facts, Section 3.3 ends. The section does not ask whether introducing 59,000–87,600 m³ of peat disturbance and 14 internal drain crossings —

the exact pressure categories the AFA programme targets — into this catchment is compatible with or would hinder RBMP delivery. It identifies the obligation and stops.

3.5.2 The Conflation That Cannot Discharge the Test

The applicant's Table 3-1 compliance conclusion (Appendix 9-1, p.26) addresses only the site-level non-deterioration test: it asserts that CEMP and SWMP mitigation will ensure compliance with non-deterioration. These are different legal questions. The site-level test asks whether harm will occur. The programme of measures test asks whether the development is compatible with State-committed restoration measures already in train. The Inspector cannot be satisfied on the second test from information that only addresses the first. An assertion that site-level controls will prevent deterioration cannot release the State or the published national Programme of Measures from their separate obligation; nor can it answer whether a proposal to disturb the AFA-target pressure category is consistent with the programme designed to reduce it.

The independent review reaches the same conclusion on the same documents and treats the two obligations as legally distinct (Hydro-G Report, Appendix 3-1, S4.1). Dr Bartley characterises the applicant's Section 3.3 as identifying the test, acknowledging every fact required to apply it — the AFA designation, the LAWPRO-led restoration programme covering eleven waterbodies, and the peat-disturbance pressure category — and then declining to complete it, ending instead on Sharavogue's rewetting without analysing whether disturbing the proposed volume of peat is compatible with, or would hinder, RBMP delivery.

3.5.3 Why the Lacuna Cannot Be Cured by Condition

The Article 4(1)(a)(iii) test is a determination required at the point of consent. A development that introduces large-scale peat disturbance and drainage modification — the exact pressure categories the AFA was established to reduce — into the priority AFA sub-basin cannot claim compatibility with the RBMP programme of measures

without any analysis of that question. The Inspector cannot supply the missing analysis: the obligation is on the applicant, the relevant primary information has not been provided, and the receiving programme of measures is administered by a different agency (LAWPRO) operating across a wider catchment than the applicant's specialist team has assessed. An Coimisiún Pleanála cannot be satisfied that the Article 4(1)(a)(iii) test has been met on the basis of an assessment that sets out the test, acknowledges every relevant fact, and contains no analysis of compatibility with the programme of measures.

This is the structural defect that CJEU C-461/17 (*Holohan*, 2018, para.44) prohibits: the assessment must contain complete, precise and definitive findings, free of lacunae. A test identified, populated with facts and then left unanswered is precisely such a lacuna. It is also the form of lacuna that cannot be saved by post-consent monitoring or by the deferred mitigation framework on which much of the rest of the application relies: the question is whether the project should be authorised in this catchment at all, given the restoration programme already underway. That question has not been answered. The applicant has waived the Article 4.7 derogation; the obligation must be discharged on the application as submitted, and it has not been.

Source: Appendix 9-1 S3.3 (p.22), p.11, p.26 (Table 3-1), p.28; SPMP App.8-3 p.7; EIAR Ch.8 Table 8-5; Water Action Plan 2024; WFD Article 4(1)(a)(iii); CJEU C-461/17 (*Holohan*, 2018) para.44; Hydro-G Report, Appendix 3-1, S4.1.

3.6 Ground 3 — Phosphorus, Iron and Other Key Pollutants: No Baseline, No Effective Mitigation

The receiving waterbody is at Poor status driven principally by nutrient and hydromorphological pressures. The proposed development will excavate between 59,000 m³ and 87,600 m³ of peat — the exact pressure category identified as a driver of failure. Three pollutant pathways follow from that disturbance: phosphorus, iron, and a wider category of peat-derived pollutants (suspended sediments, dissolved organic carbon, ammonium, low pH). The applicant has not established a pre-construction baseline for the first two, has not modelled loading for any, and proposes a mitigation system — settlement ponds calibrated to suspended solids removal — that does not address the dominant chemical form of the pollutants concerned. The construction-phase monitoring framework for the very pollutants the application identifies as critical is calibrated against baseline values that were never measured.

Each of phosphorus, iron and the wider pollutant category is also a regulated parameter under Irish and EU water law. Phosphate (as ortho-phosphate) and biochemical oxygen demand (BOD) carry binding Environmental Quality Objectives under the European Communities Environmental Objectives (Surface Waters) Regulations 2009 (S.I. No. 272 of 2009). Dr Pamela Bartley makes the regulatory framing explicit: both BOD and ortho-phosphate are Surface Water Regulation parameters with EQOs, and iron-rich peat leachate contributes to BOD as it oxidises and precipitates (Hydro-G Report, Appendix 3-1, S4.1). The application has not characterised loading against either EQO. In a Poor-status waterbody where any deterioration of any quality element is prohibited under Weser, that is determinative.

3.6.1 Phosphorus: A Circular Monitoring Framework

The applicant's own EIAR (Chapter 9, p.9-22) identifies phosphorus and nitrogen as *"the main issue which impacts on the quality of our waters and their biological health"* in this catchment. The WFD Assessment lists peat workings as a significant pressure driving

Poor status (Appendix 9-1, p.11). The proposed development will excavate between 59,000 m³ and 87,600 m³ of peat (SPMP, Appendix 8-3, p.7; EIAR Ch.8, Table 8-5). Those two facts together create an obvious question: how much additional phosphorus will be released into a Poor-status waterbody, and can the proposed mitigation prevent it?

The application contains no answer. There is no phosphorus export model. There is no nutrient loading calculation. There is no peat leachate characterisation. The independent review confirms the same omission: there is no quantification of ortho-phosphate loading from the proposed disturbed-peat excavation areas, a Surface Water Regulation parameter with a binding Environmental Quality Objective (Hydro-G Report, Appendix 3-1, S4.1).

The pre-construction sampling is inadequate to establish a baseline on its face. The applicant relies on just eight surface water samples — four taken on 23 August 2024 and four on 11 November 2024 (Eurofins Chemtest reports 24-27480 and 24-29120) — and reports only eight determinands: pH, electrical conductivity, suspended solids, chemical oxygen demand, chloride, nitrate (as NO₃), mineral oil and total TPH. Eight samples across a single late-summer-to-autumn window is not a sufficient temporal record to characterise water quality in a catchment of this sensitivity, and the reported suite omits determinands central to the waterbody's documented impairment — phosphorus foremost among them.

The omission of phosphorus is not a gap in what was tested, but in what was reported. The certificates confirm that the laboratory ran method SOP 1220 ("Anions, Alkalinity & Ammonium in Waters"), and that this method's parameter suite expressly includes Phosphate — together with Nitrite, Total Oxidisable Nitrogen, Sulfate, Alkalinity and Ammonium. Nitrate and chloride, both determinands of that same SOP 1220 run, are reported in the results tables; Phosphate is not. The determinand was within the analytical method actually performed and was simply left out of the reported data.

The result is that the pollutant the EIAR itself identifies as the main pressure on water quality and biological health in this catchment has no pre-construction baseline at all — not because it could not be measured, but because the result, if generated, was not carried into the application. The same is true of ammonium, a parameter the applicant's own assessment of peat-derived pollutants identifies as toxic to fish and aquatic life.

Compounding both failures, an established long-term reference dataset was available and went unused. An EPA national monitoring station is located on the Little Brosna immediately upstream of the site at the road bridge on Black Bull Road. This station provides an established, multi-year record against which the applicant's eight pre-construction samples could and should have been benchmarked, both to validate their representativeness and to characterise the parameters the applicant omitted, phosphorus foremost among them. The failure to reference or compare against this station means the applicant has disregarded the most authoritative available baseline for the very waterbody at issue.

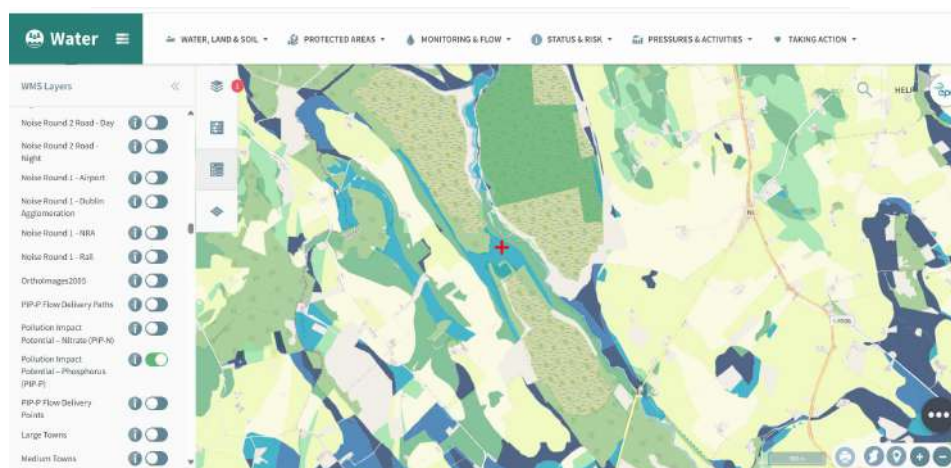
The SWMP (Appendix 9-4, Table 4-2) proposes Molybdate Reactive Phosphorus (MRP) as a construction-phase monitoring trigger at 0.035 mg/l annual average. This trigger is calibrated against *"pre-construction values"* that were never established. The trigger framework is therefore internally circular: the SWMP sets a standard against a baseline it never measured. A construction-phase exceedance cannot be calculated, detected or attributed against a baseline that does not exist.

The proposed mitigation — 19 settlement ponds — does not address the problem. Settlement ponds remove suspended solids by settling. Dissolved Reactive Phosphorus, the dominant form in peat leachate, is fully soluble and passes through settlement ponds without removal. The SWMP's own 25 mg/l total suspended solids trigger (Table 4-3) was drawn from guidance for mineral construction sites (CIRIA C648); it was not calibrated for dissolved-phase phosphorus export from lowland Irish peat. There is no engineering mitigation anywhere in the submitted documents

capable of intercepting dissolved-phase phosphorus before it enters the receiving watercourse.

The vulnerability of the receiving waterbody to exactly this category of impact is confirmed by the EPA's own Pollution Impact Potential (PIP) mapping. The PIP map (Figure 3.12 below) shows the spatial concentration of phosphorus and sediment pathway risk across the site's drainage network. The Little Brosna sub-catchment is ranked at susceptibility category 2 under the Water Framework Directive, reflecting the combination of pathway susceptibility and existing pressures already identified for the waterbody, which has been retained at Poor status across both the second and third WFD monitoring cycles. Introducing large-scale peat excavation and drainage works into a catchment the EPA has already mapped as susceptible to nutrient and sediment loading, and which is failing on those very parameters, runs directly counter to the State's own evidence base for this waterbody.

Figure 3.12: EPA Catchments / PIP mapping, Little Brosna sub-catchment.



The application cannot demonstrate, and has not attempted to demonstrate, that excavating between 59,000 and 87,600 m³ of peat in a nutrient-impaired catchment will not cause further deterioration of a waterbody already at Poor status, where any further deterioration is absolutely prohibited.

While maintenance and cleaning of silt traps and ponds are referenced in the planning documents, the regime of cleaning and checking is referred to only as "at least

weekly." That frequency may not be adequate, and the maintenance of these structures post-construction is not outlined.

3.6.2 Iron Ochre: Photographic Evidence on Site, Absent from Monitoring

Direct photographic evidence of groundwater conditions encountered on site is provided by Trial Pit TP17 below (Appendix 8-1, image 69/111)

Figure 3.13: Trial Pit TP17



The pit demonstrates vivid ferrous iron precipitation — iron ochre — in standing groundwater at shallow depth. The immediate groundwater ingress confirms the water table is at or near surface in the peat profile: this is not accumulated rainfall but groundwater influx. The independent review draws attention to the same evidence, noting that the iron content of the waters in the trial-pit photographs is not evaluated in the context of its effect on biochemical oxygen demand in the nutrient-impaired receiving waterbody, both BOD and ortho-phosphate being Surface Water Regulation

parameters with Environmental Quality Objectives (Hydro-G Report, Appendix 3-1, S4.1).

Iron is absent from both the pre-construction water chemistry sampling (Appendix 9-2) and the construction-phase monitoring trigger framework (SWMP Appendix 9-4, Table 4-2). No iron trigger value is proposed anywhere in the submitted documents. The framework reproduces the same circular failure identified above for phosphorus: a parameter known from the applicant's own ground investigation to be present in mobilisable form is not baselined and is not monitored, so any construction-phase exceedance cannot be calculated, detected or attributed.

Iron ochre (ferric hydroxide precipitate) released to watercourses coats and suffocates macroinvertebrate substrates, damages salmonid gills, smothers spawning gravels and directly suppresses Q-values. The Little Brosna_040 is at Q3 — Poor status. Any further suppression of the benthic macroinvertebrate community from iron ochre deposition would constitute deterioration of a quality element already near the floor of the classification scale, directly triggering the Weser prohibition.

The omission engages the Surface Water Regulations directly. Biochemical oxygen demand is a regulated physico-chemical parameter under S.I. No. 272 of 2009, carrying a prescribed Environmental Quality Objective. The iron evidenced in the TP17 groundwater is not a neutral observation: ferrous iron exerts an oxygen demand as it oxidises and precipitates, and iron-rich peat leachate entering the watercourse contributes to BOD as well as to the direct smothering of macroinvertebrate substrates. The applicant has neither baselined iron nor assessed its contribution to a regulated parameter with a binding objective, in a waterbody whose Poor status leaves no headroom for any deterioration of any quality element.

The same engineering point made above for dissolved phosphorus applies: settlement ponds remove suspended solids by settling and do not treat dissolved-phase pollutants. Iron mobilised from peat groundwater enters the receiving system in both

particulate and dissolved forms; the dissolved fraction passes through settlement ponds without removal. There is no engineering mitigation anywhere in the submitted documents capable of intercepting either dissolved-phase iron or dissolved-phase phosphorus before it reaches the watercourse.

The risk pathway is direct and proximate. Foundation excavations at T3, T4, T8 and T9 are anticipated to 4.5 m bgl (CEMP, Appendix 2-3, p.11), through saturated peat columns of up to 3.2 m depth with groundwater at 0.4–1.5 m bgl (EIAR Ch.9, p.9-29). Any excavation through this profile will mobilise iron-laden water. The suggestion that limited dewatering may be required at T8 and T9 due to low-permeability clays does not reduce the risk: low-permeability clays cause iron-rich peat groundwater to be perched and concentrated above the clay horizon, increasing the iron load in the water that excavation will release.

3.6.3 Other Peat-Derived Pollutants and the Downstream Drinking-Water Pathway

Several further pollutant pathways arise from large-scale peat disturbance, each compounding the loading risk addressed above:

- **Suspended peat sediments (siltation).** Large volumes of loose peat enter the water, causing extreme turbidity. Silt settles on the riverbed, smothering spawning grounds for salmon and trout, blocking sunlight, and destroying the habitat of aquatic macroinvertebrates.
- **Dissolved organic carbon (DOC).** The breakdown of sphagnum moss and organic materials leaches heavily into the stream, turning the water a dark yellow-brown colour. While natural at background levels, excess DOC strips oxygen from the water as it degrades, and reacts aggressively with chlorine at water treatment plants to form carcinogenic trihalomethanes (THMs), making downstream water difficult and expensive to treat for human consumption.
- **Ammonium (NH_4^+) and ammonia (NH_3).** The microbial breakdown of bog organic matter releases high levels of ammonium. When it enters watercourses with a higher pH, it converts into un-ionised ammonia, which is highly toxic to fish and aquatic life.

Ammonium is also a parameter run under the SOP 1220 method on the applicant's own pre-construction samples but absent from the reported results — the same omission identified at G3.1 above.

- **Low pH (humic acidification).** Natural humic acids within the bog lower the pH of the receiving watercourse. Sudden acidification can shock fish, disrupt respiratory function, and cause toxic heavy metals (aluminium, lead) naturally bound in nearby soils to leach into the water column.

Monitoring of some of these parameters is referenced in the SWMP but the frequency for each individual measure is not specified; the framework relies on wider monitoring within the workzone rather than parameter-specific triggers.

The significance of these pollutant pathways is heightened by the site's hydrological connectivity to public water supply. While the site does not lie within a drinking-water abstraction protection zone, it drains via the Little Brosna and the Shannon to Lough Derg — a strategic drinking-water source serving abstractions including Coolbawn and the Limerick supply. Pollutant loading that would be serious in any watercourse carries an additional public-health dimension. DOC is the particular concern in this respect: increased DOC loading from peat disturbance translates directly into increased THM formation at downstream treatment works, with implications for public-health compliance that the application does not address.

3.6.4 The Volume Discrepancy Compounds the Loading Risk

The SPMP (Appendix 8-3, p.7) gives total peat excavation as 59,000 m³. EIAR Chapter 8 (Table 8-5) records total peat excavated as 87,600 m³ (91,950 m³ bulked). This discrepancy of approximately 50% has not been reconciled anywhere in the submitted documents. The phosphorus, iron and DOC loading risks calculated against the lower figure understate the actual loading by approximately the same proportion. The application cannot demonstrate non-deterioration against a loading figure that is itself uncertain by 50%.

3.6.5 Legal Consequence

The Weser prohibition applies to each quality element of the receiving waterbody. Phosphorus, ammonium and BOD are physico-chemical quality elements with binding EQOs under S.I. No. 272 of 2009. Macroinvertebrate community condition is a biological quality element directly suppressed by iron ochre, suspended peat sediment and low pH. The Little Brosna_040 is at Poor status across both the biological and the physico-chemical limbs. Any construction-phase reduction in any of those elements — including a temporary reduction — is prohibited under CJEU C-461/13 (*Weser*, 2015), paras 67 and 69.

The application has not baselined phosphorus. It has not baselined iron. It has not modelled loading for either, nor for DOC, ammonium or low pH. It proposes a treatment system that cannot remove the dissolved-phase forms in which the dominant pollutant load will arrive. It calibrates its monitoring triggers against baseline values that were never measured. The Weser obligation cannot be discharged on the application as submitted. The applicant has waived the Article 4.7 derogation. Full compliance must be demonstrated; on the water-quality limb, it has not been.

Source: EIAR Ch.9 p.9-22, p.9-29; Appendix 9-1 p.11; Appendix 9-2 (Eurofins Chemtest reports 24-27480, 24-29120); Appendix 8-1 TP17 image 69/111; Appendix 8-3 (SPMP) p.7; EIAR Ch.8 Table 8-5; CEMP App.2-3 p.11; SWMP App.9-4 Table 4-2, Table 4-3; CIRIA C648; EPA Pollution Impact Potential mapping (Little Brosna sub-catchment); S.I. No. 272 of 2009 (European Communities Environmental Objectives (Surface Waters) Regulations); CJEU C-461/13 (*Weser*, 2015) paras 67, 69; Hydro-G Report, Appendix 3-1, S4.1.

3.7 Ground 4 — Tributary Network: Unassessed First-Link Receptors

3.7.1 The Tributaries Are the Actual Discharge Pathway

The EIAR and WFD Assessment treat the Little Brosna_040 main channel as the primary receptor for construction-phase water quality impacts. This framing is incorrect. The Little Brosna does not receive construction runoff directly, it receives it via the network of tributary streams that cross and drain the wind farm site: the Holy Well Clohaskin, Wingfield 25, Faddan Beg, North Cloonaheen, Rath Beg, Pallas 25, Kyleneamuck and Pallas Kyleneamuck streams. These tributaries are the first link between the development and every downstream European site.

Figure 3.14: The Tributary Network within and around the Site



The image above captures a map of the tributary network crossing the wind farm site, showing confluence points with the Little Brosna and locations of aquatic survey sites.

3.7.2 The Pallas Kylenamuck — Bad Status Within the Construction Footprint

The applicant's own aquatic ecologist surveyed a selection of these tributaries and recorded results in the aquatic ecology survey (Appendix 6-3 to the NIS). The ecologist's summary conclusion is unambiguous: "the overall biological water quality in the watercourses draining the proposed wind farm site is poor and moderately polluted. The sampled watercourses do not provide water of a quality adequate to support a range of pollution sensitive mayfly and stonefly larvae, as well as salmonids." (Appendix 6-3, Section 3.2.8, p.30).

Table 3-4: Biological Water Quality and Interpretations at Study Sites on Watercourses Draining the proposed project.

Site	Q-value	WFD Ecological Status
1	3-4	Moderate status (Slightly Polluted)
3	3	Poor status (Moderately Polluted)
10	3	Poor status (Moderately Polluted)
11	2	Bad status (Seriously Polluted)

Not one surveyed in-site tributary achieved Q4 Good status. Three were rated Q3 — Poor. The fourth — the Pallas Kylenamuck stream (Site 11, EPA Code 25P56) was rated Q2: Bad/Seriously Polluted. It is a first-order stream that runs through the northeast of the wind farm site and discharges to the Little Brosna River approximately 25 metres downstream of the survey point (Appendix 6-3, Section 3.2.3.11, p.22).

At Q2, the Pallas Kylenamuck is one step from the absolute floor of the WFD classification scale. Under the Weser obligation (CJEU C-461/13, para.69), any further deterioration of a quality element already at or near the lowest class constitutes a breach of the non-deterioration obligation. The construction footprint — peat excavation, access road drainage, hardstand runoff, concrete risk and fuel management — sits directly within this stream's catchment. Its Q2 status is recorded by the applicant's own ecologist. The risk of further deterioration during construction is

self-evident and unassessed. No response to this finding appears anywhere in EIAR Chapter 9, Appendix 9-1, or the NIS.

3.7.3 Five Tributaries Have No Baseline

Five further named tributaries within or adjacent to the wind farm site — the Holy Well Clohaskin, North Cloonaheen, Rath Beg, Pallas 25 and Kylenamuck streams — received no biological water quality sampling. The survey report acknowledges this as a constraint due to access limitations (Appendix 6-3, Section 2.2.11, p.14). The Holy Well Clohaskin is one of the primary discharge pathways from the site and is listed as monitoring point SM4 in the SWMP. A monitoring programme cannot detect deterioration in a watercourse for which no pre-construction biological condition has been established.

The NIS pathway analysis to the River Shannon Callows SAC and associated SPAs proceeds as if the Little Brosna main channel is the pathway. It is not. Any degradation generated during construction reaches the Little Brosna through these tributaries first. A conclusion that no adverse effects on European site integrity will occur cannot be sustained where the pre-construction biological condition of the most direct discharge pathways has not been established, and where the one tributary that has been assessed is at Q2 Bad/Seriously Polluted with no assessment of further deterioration risk. This is precisely the lacuna that CJEU C-461/17 (Holohan, 2018, para.44) prohibits.

Source: Appendix 6-3, Section 3.2.3.11 p.22, Section 3.2.8 p.30, Section 2.2.11 p.14; Appendix 9-1, p.7; SWMP App.9-4; CJEU C-461/13 (Weser, 2015) para.69; CJEU C-461/17 (Holohan, 2018) para.44

3.8 Ground 5 — Construction in Flood Zone A/B and the Justification Test

3.8.1 The Flood Zone Context

At the outset it is important to say that the High Probability / Flood Zone A designation is more typical for this area. That is never considered anywhere in the document. The Applicant moves to an analysis based only on Medium probability – Flood Zone B in their analysis using Mid-Range future scenarios. At no point do they engage the +30% High end future scenario. Given that failure, the following review will consider only what the Applicant presents as the Mid-range scenario +20%.

The applicant's FRA (Appendix 9-3) uses CFRAM modelling to confirm that four turbines are in Flood Zone A or B under existing conditions. The data is as follows:

Table 3.2 : Existing Conditions (1% AEP — 1-in-100 year event)

Turbine	Hardstand inundated	Notes
T1	~25%	Access roads within flood envelope
T2	~5%	Peat depth 0.3–1.2m; foundation to 4.5m bgl
T8	~5%	50m from Little Brosna and SAC boundary
T9	~50%	Deepest peat on site; closest to SAC

Table 3.3: Mid-Range Future Scenario (MRFS, +20% peak flows)

Turbine	Hardstand inundated at 1% AEP
T1	~40%
T2	~25%
T8	~15%
T9	~75%

Source: FRA App.9-3, pp.11–12 and pp.17–18

3.8.2 The Justification Test

The applicant acknowledges that the Justification Test under the Planning System and Flood Risk Management Guidelines (OPW/DoEHLG, 2009) is required for T1, T2, T8 and T9. Wind farms are classified as essential infrastructure, appropriate **only** in Flood Zone C. The following analysis demonstrates that the Justification Test is not met on any of the stated criteria.

Figure 3.15 The Justification

Box 5.1 Justification Test for development management (to be submitted by the applicant)

When considering proposals for development, which may be vulnerable to flooding, and that would generally be inappropriate as set out in Table 3.2, the following criteria must be satisfied:

1. The subject lands have been zoned or otherwise designated for the particular use or form of development in an operative development plan, which has been adopted or varied taking account of these Guidelines.
2. The proposal has been subject to an appropriate flood risk assessment that demonstrates:
 - (i) The development proposed will not increase flood risk elsewhere and, if practicable, will reduce overall flood risk;
 - (ii) The development proposal includes measures to minimise flood risk to people, property, the economy and the environment as far as reasonably possible;
 - (iii) The development proposed includes measures to ensure that residual risks to the area and/or development can be managed to an acceptable level as regards the adequacy of existing flood protection measures or the design, implementation and funding of any future flood risk management measures and provisions for emergency services access; and
 - (iv) The development proposed addresses the above in a manner that is also compatible with the achievement of wider planning objectives in relation to development of good urban design and vibrant and active streetscapes.

The acceptability or otherwise of levels of residual risk should be made with consideration of the type and foreseen use of the development and the local development context.

Note: See section 5.27 in relation to major development on zoned lands where sequential approach has not been applied in the operative development plan.

Refer to section 5.28 in relation to minor and infill developments.

Figure 2-1: Criteria of the Justification Test

Test

3.8.2.1 Criteria 1 — The subject lands have been zoned or designated : The Land Is Not Designated for This Form of Development

Discussed at length previously, Offaly County Council's Wind Energy Strategy, produced under SEA, AA and OPR oversight, identified the Ballincor area as unsuitable for wind farm development. This site is not designated or zoned for wind energy infrastructure. The applicant addresses this criterion with a single sentence about site selection. That is not a demonstration of designation.

The Supreme Court in Coolglass Wind Farm Limited v An Coimisiún Pleanála [2026] IESC 5 was explicit that developments must not be assessed in isolation from their broader county and regional context. Climate action obligations can be met in lower-risk, designated locations. A site carrying flood risk to four turbines, a Poor-status receiving waterbody and an active Natura 2000 restoration catchment within 10m of the perimeter does not satisfy Criteria 1 simply because a developer has chosen it.

Source: Offaly County Council Wind Energy Strategy; Coolglass Wind Farm Limited v An Coimisiún Pleanála [2026] IESC 5

3.8.2.2 Criteria 2 — *The proposal has been subject to an appropriate flood risk assessment – and will reduce not add to flood risk*

Criteria 2 requires confirmation that the development will be safe throughout its lifetime and will not increase flood risk elsewhere. The applicant proposes raised platform levels and an emergency management protocol as the primary response. Six specific failures, each demonstrated from within the submitted documents and drawings, establish that this confirmation has not been made.

1. The SWMP/FRA irreconcilable contradiction. The SWMP (Appendix 9-4, pp.19–20) requires an ECoW to be on-site during major rainfall events (15mm in 6 hours) and gives the Environmental Manager Stop Works Authority. The FRA (Appendix 9-3, p.23) states: "Access roads are only used to provide maintenance to the turbines and are therefore not to be used after any heavy rainfall." These two commitments cannot be honoured simultaneously. The same rainfall events that require ECoW presence on site are the events during which the access roads are impassable. This is not a detail — it is the core enforcement mechanism of the WFD compliance case failing under precisely the conditions when it is most needed.

2. The SuDS system cannot function under flood conditions. The mitigation proposed is designed for construction site runoff and is generic in its presentation (swales, check dams, silt fences, settlement ponds). It provides no protection against fluvial inundation, which is the mechanism confirmed by the applicant's own FRA. When floodwater arrives from the Little Brosna and its tributaries across the site, swales become conduits for floodwater rather than drainage control features; check dams, bearing on saturated peat subsoils, are vulnerable to undermining and blowout; silt fences, designed for slow sheet flow, are inundated, undermined or physically destroyed; and settlement ponds are submerged and reversed, with accumulated sediment — including construction contaminants concentrated through the system over weeks of works — re-mobilised and discharged directly into the Little Brosna at peak flow. The SWMP itself states that maintenance must not take place during periods of extended heavy rain; the ponds will therefore be at or near sediment capacity when the next flood arrives.
3. The discharge quality standard the applicant relies upon is both inadequately set and operationally unverifiable. The SWMP applies a turbidity limit of 50 NTU, whereas a limit of the order of 10 NTU is the conventional standard for discharge to a sensitive watercourse, and any such limit should properly be referenced to the measured baseline turbidity in the Little Brosna rather than to a value that is meaningful only in dry-weather conditions. Under flood conditions, the very scenario the applicant's own FRA confirms, the 50 NTU limit cannot be verified at all: once the SuDS features are inundated by fluvial floodwater, there is no defined discharge point at which compliance can be measured. Compounding this, the application proposes no control mechanism by which runoff or discharge would be halted in the event that the 50 NTU limit is exceeded. There is no shut-off, no containment-on-exceedance, and no defined intervention. A discharge standard that cannot be measured under the conditions that matter, and that triggers no action when breached, provides no protection to the receiving waterbody.
4. The engineering drawings confirm that this failure is structural, not contingent. Drawing 11333-2034 (Track Swales, Drains and Settlement Pond Details) shows settlement pond embankments constructed from "suitable excavated materials" with a permanent water level of approximately 0.5m and a top water level at 1–1.5m depth. The embankments are temporary earthwork structures with no specification for resistance to lateral flood pressure from the river side, no flood bypass arrangement, and no minimum base level defined relative to the CFRAM flood envelope. The drainage layout plans (11333-2061 to 11333-2065) confirm that pond

sizes "depend on catchment area served" — not one of the nineteen proposed settlement ponds is individually sized anywhere in the submitted application. No controls on how run-off would be halted if discharge limits exceed the applicants limit of 50 NTU is proposed.

5. The buffer zone prohibition is undesignable in the T8/T9 corridor. Every drainage layout plan (Drawings 11333-2061 to 11333-2065) carries an identical Note 5: "Surface water will not be allowed to discharge directly into existing watercourses." Drawing 11333-2034 (Section D-D) shows the mechanism for honouring this: the pond outfall discharges via a flow control device to "an area of intact vegetation" that acts as a secondary filter before any watercourse is reached. The SWMP (p.18) confirms a buffer zone between the pond outfall and any existing watercourse is required. No drawing specifies the minimum width of this buffer. In the T8/T9 corridor, where the drainage layout plans show settlement ponds positioned within metres of the Little Brosna floodplain and its tributary network, that buffer zone cannot exist. The prohibition is stated on every drawing; no drawing demonstrates how it is achievable at the locations where it matters most.
6. The primary stormwater structure is designed below its own mandatory flood level. Drawing 11333-2036 (Attenuation Tank Details) shows the underground concrete attenuation tank — the primary stormwater management structure for the substation compound — with a Finished Ground Level (FGL) of 46.35mOD. The FRA (Section 4.5, p.22 and Section 5, Conclusions) requires that all critical infrastructure be constructed to a minimum level of 46.5mOD — at least 300mm above the 1,000-year MRFS fluvial flood level. The tank's FGL of 46.35mOD is 150mm below that mandatory minimum. There is no note on the drawing explaining this discrepancy, no dispensation, and no hydraulic justification. This is a direct engineering conflict on the face of the submitted documents: the drainage drawing and the FRA contradict each other on the most basic design datum for the structure on which WFD compliance is predicated.

Three additional modelling failures are present:

- The FRA contains an unresolved internal inconsistency on flood compensation storage. Section 4.1 (p.20) describes compensation storage with "an area of approximately 14,000m²" at approximately 1m depth; Section 4.5 states "an additional 14,000m³ of compensation storage will be provided." The same figure is applied as both area (m²) and volume (m³) in different sections. At 1m depth,

14,000m² of storage gives a volume of 14,000m³ — nearly five times the 3,000m³ claimed to be removed from the floodplain. No hydraulic model resolves this.

- **Separately, the CFRAM study modelled the Little Brosna main channel only; the Holy Well Clohaskin, Rath Beg and Pallas 25 streams — the watercourses most directly flanking T1 and T2 — were not modelled, leaving the adequacy of the 46.5mOD design level unverified for those turbines.**
- **Finally, the applicant applied a +20% MRFS uplift to derive design levels but did not assess the +30% High-End Future Scenario (HEFS). The 300mm freeboard above MRFS flood levels may be entirely consumed by the gap between MRFS and HEFS over a 35-year operational lifetime.**

Source: Appendix 9-1, p.17; SWMP App.9-4, pp.19–20; FRA App.9-3, p.23, Section 4.1 p.20, Section 4.5 p.22, Section 5; Drawings 11333-2034, 11333-2036, 11333-2061 to 11333-2065; NIS Appendix C; CJEU C-323/17 (People Over Wind, 2018)

3.8.2.3 Criteria 2(iv)— Compatibility with Wider Planning Objectives

The proposed wind farm falls within the Little Brosna AFA designated for restoration, with peat workings and drainage identified as the primary drivers of failure. Introducing a major peat excavation project into an active State restoration catchment is not compatible with the programme of measures that defines the relevant wider planning objective for this waterbody under the RBMP. The applicant presents no analysis of this compatibility. Criteria 2 (iv) is not met. Source: Appendix 9-1, Section 3.3; Water Action Plan 2024

3.8.3 The Consequence for the Habitats Directive Assessment

The Justification Test failure does not stand alone in the consenting framework. The Surface Water Management Plan whose structural failure under flood conditions is documented at above is the same SWMP appended to the NIS as Appendix C and relied on by the NIS as the sole mechanism for excluding indirect adverse effects on the six connected European sites. The NIS conclusion at p.213 confirms this dependency:

"Through the careful design of the proposed project, in combination with the detailed avoidance and mitigation measures outlined in Section 6.2, the potential for significant adverse effects on any European sites in view of their conservation objectives will be fully avoided."

The conditional construction of that sentence — *"in combination with the detailed avoidance and mitigation measures"* — is not incidental. The NIS itself acknowledges at S6.1 (p.117) that, in the absence of those measures, indirect adverse effects on all six European sites cannot be excluded. The SWMP's own conclusion (NIS Appendix C, p.24) goes further: it states the plan *"will ensure that all water within the construction works will be collected and treated before being released to the downstream watercourses."* That claim has been tested against the applicant's own FRA and submitted drawings at SG5.2 above and it fails. The SWMP cannot function during fluvial flood events at T1, T2, T8 and T9; the discharge standard cannot be measured once the SuDS features are inundated; the prohibited direct-to-watercourse buffer cannot be designated in the T8/T9 corridor; and the primary attenuation structure is constructed below its own mandatory flood level on the face of the submitted drawings.

An Appropriate Assessment conclusion of no adverse effect on integrity, premised entirely on a mitigation document that fails structurally during the foreseeable site conditions that define the receiving environment, does not satisfy Article 6(3) of the Habitats Directive. Under CJEU Case C-323/17 (*People Over Wind*, 2018), mitigation measures must be assessed in full in the NIS itself, not assumed to operate as intended. That assessment has been carried out here, on the applicant's own submitted documents and drawings, and the central mitigation mechanism fails. Under CJEU Case C-461/17 (*Holohan*, 2018, para.44), an Appropriate Assessment must contain complete, precise and definitive findings free of lacunae. A finding of "fully avoided" indirect adverse effect, dependent on a mitigation system that is shown to be inoperable under the conditions in which it would be required to operate, is precisely the form of finding that *Holohan* prohibits.

3.8.4 Legal Standard and Conclusion

This ground fails simultaneously on three legal limbs:

- The Planning System and Flood Risk Management Guidelines (OPW/DoEHLG, 2009).**
 The Justification Test is not met on any of Criteria 1, 2 or 2(iv). The subject lands are not designated for wind energy infrastructure (*Coolglass Wind Farm Limited v An Coimisiún Pleanála* [2026] IESC 5). The proposal does not demonstrate that flood risk will not be increased elsewhere; on the applicant's own documents, the proposed mitigation cannot function during the flood events the FRA confirms will occur. The proposal is not compatible with the wider planning objective for this waterbody under the Water Action Plan 2024 and the AFA restoration programme.
- WFD Article 4(1)(a)(i) — non-deterioration.** The SWMP is the engineering mechanism on which the applicant's WFD compliance case at Appendix 9-1 ultimately depends. A SWMP that cannot function under the foreseeable flood conditions confirmed by the FRA cannot demonstrate non-deterioration of a waterbody already at Poor status (Ground 1 above) under the Weser standard (CJEU C-461/13, paras 67, 69).
- Habitats Directive Article 6(3).** The NIS conclusion of no adverse effect on integrity is conditional on the SWMP. The SWMP fails on the applicant's own documents during foreseeable site conditions. *People Over Wind* (C-323/17) prohibits reliance on unassessed mitigation; *Holohan* (C-461/17, para.44) prohibits an assessment containing lacunae of this kind. The applicant has waived the Article 6(4) IROPI derogation (NIS p.4). Full Article 6(3) compliance must be demonstrated on the application as submitted. On the flood-condition limb, it is not.

The cumulative effect across the three legal limbs is decisive for refusal on this ground alone, independently of the other grounds in this chapter.

Source: NIS p.117, p.213, Appendix C p.24; SWMP App.9-4 pp.19–20; FRA App.9-3 p.23, S4.1 p.20, S4.5 p.22, S5; Drawings 11333-2034, 11333-2036, 11333-2061 to 11333-2065; PSFRM Guidelines (OPW/DoEHLG, 2009); *Coolglass Wind Farm Limited v An Coimisiún Pleanála* [2026] IESC 5; Water Action Plan 2024; CJEU C-461/13 (*Weser*, 2015) paras 67, 69; C-323/17 (*People Over Wind*, 2018); C-461/17 (*Holohan*, 2018) para.44.

3.9 Ground 6 — Access Tracks in Flood Zone A/B: No Investigation, No Design, No Mitigation

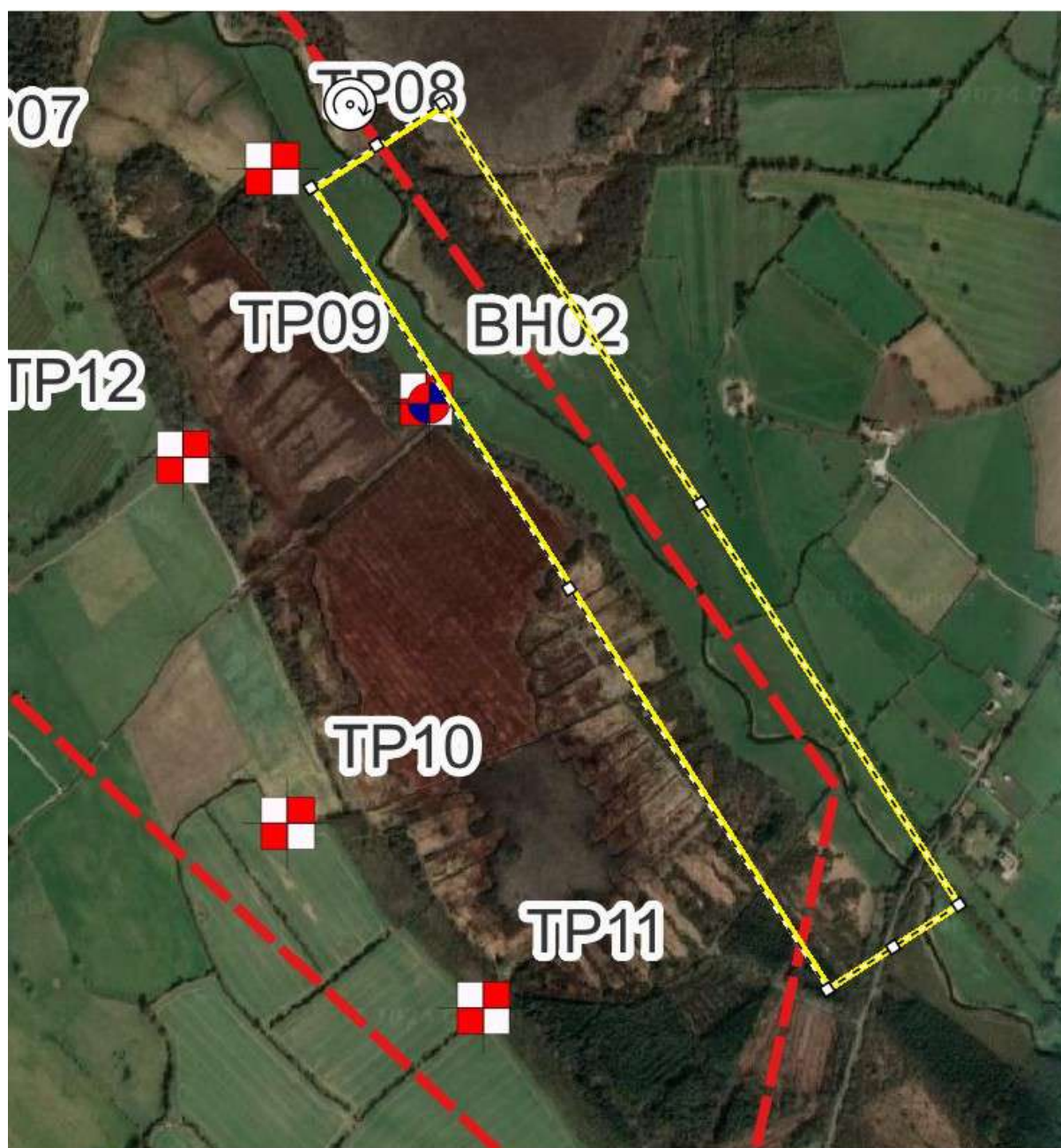
This ground addresses three compounding failures in the access track proposals for the T8/T9 eastern corridor, the most sensitive zone on the development site. Each failure is serious individually. Together they establish that the track infrastructure in the highest-risk zone of this application has not been investigated, has not been designed, and has no adequate flood mitigation. That is not a matter that can be resolved by condition.

3.9.1 No Ground Investigation Along the Track Alignment

The SPMP (Appendix 8-3, p.9) asserts: *"Ground investigations in the form of peat probing and trial pitting has been carried out along the proposed access routes to inform the depth of excavation and upfill required for the access tracks."* This statement does not withstand scrutiny when the submitted investigation data is examined.

The ground investigation comprised 23 trial pits and 3 boreholes across the entire site. In the T8/T9 zone — the valley floor in Flood Zone A/B, closest to the river and the SAC — the investigation points are TP08, TP09 and BH02. All three are located at or near the turbine hardstand positions. See Figure 3.14 below. Not one trial pit or borehole was positioned along the access track alignment in this corridor. Peat probes in this area were located at turbine positions only. The claim that ground investigation has informed track design in this zone is not supported by the ground investigation data submitted.

Figure 3.16: Trial Pits/Boreholes from RWE Application



This matters because the peat depth map (EIAR Figure 8-6, Appendix 8-2 PSRA page 40) shows the deepest peat on the site concentrated in precisely this corridor — 2.1–3.9m depths clustered around T4, T8 and T9 (EIAR Ch.8, p.8-22). The zone with the deepest peat, the highest flood risk and the greatest proximity to the river and SAC is the zone with the least investigation along the route where tracks will actually be built.

3.9.2 No Founding Stratum — and No Viable Alternative

The data from the three investigation points closest to the track corridor reveals the following:

- **TP08** (Appendix 8-1): Peat to 2.1m; soft peaty silt to 3.1m; soft sandy silt to 3.70m. Trial pit terminated by sidewall collapse. Competent stratum not reached.
- **TP09** (Appendix 8-1): Peat to 2.7m; soft peaty silt to 3.70m. Trial pit terminated by sidewall collapse. Competent stratum not reached.
- **BH02** (Appendix 8-1): 2.3m of peat, then a continuous column of very soft silt and clay from 2.3m to 12.80m. Every Standard Penetration Test from 2.30m to 12.80m returned SPT N=0 — zero resistance, the sampler penetrating under its own weight. The first material with any measurable resistance (N=7, still very soft) appeared at 12.80m. Dense gravel did not appear until 15.80–18.80m. This Borehole is the closest ground investigation site to the proposed access tracks in this area.

The SPMP (Appendix 8-3, pp.9–11, Table 2-2) sets out a binary design approach: founded tracks are excavated to competent stratum and constructed upward from it; floating tracks are used where peat exceeds 1m depth. The SPMP states that *"the majority of the tracks are likely to be constructed as founded tracks"* and that excavation will proceed *"to a competent geological stratum with adequate cross drainage."* Neither option is viable in the T8/T9 corridor as the investigation data stands.

There is no competent stratum within any excavation depth achievable by construction plant. TP08 and TP09 both collapsed before reaching competent material. BH02 shows 12m of SPT N=0 material below the peat — not peaty subsoil, but near-liquid silt. A founded track cannot be built to a stratum that was not found.

The floating track option does not resolve this. The PSRA (Appendix 8-2, Appendix 3, Assessment Areas 8 and 9) assesses the characteristic undrained shear strength of the peat at this location as **10 kPa** — the lowest value used across the site, with the T_g factor of safety under undrained conditions assessed at only 3.4, the lowest on the site. The SPMP (Appendix 8-3, p.13) acknowledges that in deeper peat areas it *"may be deemed necessary"* to install pressure berms of 2–5m width on each side of the floating track to prevent bearing failure beneath it. Whether these berms are needed at T₈/T_g is unresolved because the detailed design has not been done. The finished track width itself — *"approximately 5-6m (to be confirmed by the designer)"* (SPMP, p.13) — remains unconfirmed. A floating track with an unconfirmed width, an undesigned geogrid specification, and a conditional pressure berm requirement, on peat with a 10 kPa characteristic shear strength and SPT N=0 material to 12.8m below, is not a designed solution. It is a placeholder.

The SPMP explicitly defers the only design element that would make a floating track structurally meaningful: *"Details of geogrid arrangement will be provided by the specialist geogrid provider/designer"* (Appendix 8-3, p.12). The specialist has not been appointed. This is confirmed by the applicant's own PSRA consultant, who recommended *"specification of additional site investigations inclusive of in situ testing and laboratory testing in specific risk areas on the site"* before detailed design can proceed (Appendix 8-2, Section 7.1). That investigation has not been done. The planning authority is being asked to grant permission before it has been carried out.

3.9.3 The Mitigation Matrix Excludes the Access Track Corridor

Ch 2 Table 2-6 (Surface Water Mitigation Matrix, p.2-37) confirms that the >50m buffer and settlement pond measures are not applied to access tracks or the GCR. The applicant's own mitigation matrix records that the primary water quality controls do not extend to the linear infrastructure running through Flood Zone A/B. Every category in the matrix is also marked "Weather dependent."

Table 2-6 Surface water mitigation matrix

	Turbines	Substation and compounds	Deposition areas	Access tracks	Borrow Pits	GCR
Utilise existing bridges and access roads	-	-	-	++	-	++
>50m Buffer	++	++	++		++	
Interceptor drains	++	++	++	++	++	
Check Dams or similar	++	++	++	++	++	++
Swales	++			++	++	
Sediment traps	++		++			++
Settlement Ponds	++	++	++		++	
Proprietary Settlement tanks	+	+			++	
Weather dependant	++	++	++	++	++	++
Silt Fences	++		++	++		++
Clear Span Bridge				++		
Concrete washout control measures	++	++				++
Chemical/fuel bunds	++	++	++		++	++

The CEMP (App 2-3, 4.1.3.2) describes the silt/SuDS programme in generic terms only, with no site-specific application to the T8/T9 corridor or any of the four turbines confirmed by the FRA to lie in Flood Zone A/B.

3.9.4 Generic, Flood-Blind Drainage Design

Drawing 11333-2033 (Track Construction Details) shows three standard track types applicable across the whole site. Type 1 is the excavate-and-replace section; Type 2 is the floating track on geogrid; Type 3 is widening of an existing track. The drawing is a generic planning-stage cross-section. It contains no specification, notation or dimension that has been modified for Flood Zone A/B conditions. No flood level is shown. No outfall elevation is specified. No scour protection is detailed. The drainage design — swales, 300mm cross drains, check dams — is identical to what would be prepared for a Flood Zone C location anywhere in Ireland. The specific deficiencies on Drawing 11333-2033 compound the ground investigation failures directly:

- The Type 2 floating track detail carries the note "*SUITABLE GEOGRID / GEOTEXTILE IF REQUIRED (DESIGNED TO ACCOMMODATE GROUND CONDITIONS)*" — not a specification, but an instruction that a specification is required. No geogrid strength,

stiffness, or aperture is given. No bearing pressure calculation is referenced. There is no acknowledgement of the SPT N=0 conditions at T8/Tg confirmed by BH02.

- The swale on the floating track cross-section (Type 2) is shown running at the same level as the track surface, immediately alongside it. In the T8/Tg flood corridor, this swale would be within the flood envelope at the 1% AEP event alongside the hardstand itself. The drawing contains no flood bypass arrangement, no outfall elevation check relative to CFRAM levels, and no scour protection at any outfall point.
- The drainage design is also missing elements that would be expected as a minimum for any linear infrastructure in Flood Zone A/B: no hydrostatic uplift specification beneath geogrid layers under inundation; no confirmation of settlement pond base levels relative to CFRAM flood extents; no flood bypass provision on any settlement pond.

The drainage layout plans (Drawings 11333-2061 to 11333-2065) carry Note 5 on every sheet: *"Surface water will not be allowed to discharge directly into existing watercourses."* Drawing 11333-2034 shows the mechanism for this: the pond outfall discharges via a flow control device to an area of intact vegetation acting as a secondary filter buffer before any watercourse. The SWMP (p.18) confirms a buffer zone between the pond outfall and any watercourse is required. No drawing specifies the minimum width of this buffer. In the T8/Tg corridor, where settlement ponds sit within metres of the Little Brosna floodplain, that buffer does not exist. As stated under Ground 2, the SWMP and FRA are irreconcilable on whether site access is even possible during the rainfall events when these controls are most needed: the SWMP (Appendix 9-4, pp.19–20) requires an ECoW on site during 15mm/6-hour events; the FRA (Appendix 9-3, p.23) states access roads must not be used after heavy rainfall. The ECoW cannot access the site at the moment environmental controls most need activation.

At a 1-in-100-year event — when Tg hardstand is 50% inundated and the access corridor is submerged — every element of this drainage system fails: swales are within the flood envelope; check dams are submerged; settlement ponds reverse and discharge accumulated sediment; and no ECoW can reach the site. The drainage drawings do not acknowledge this. They present a standard construction drainage system as if the site were on dry, Flood Zone C ground.

3.9.5 Legal Consequence

The EIA Directive (Article 5, Annex IV, transposed by s.172 Planning and Development Act 2000) requires the EIAR to contain the information necessary to assess the significant effects of the development. Three requirements follow from this in the T8/T9 corridor: a ground investigation adequate to establish founding conditions along the track alignment; a structural design for the track appropriate to those conditions; and a drainage design that accounts for the confirmed flood regime. None of the three has been provided.

The SPMP asserts that investigation has informed track design in this corridor. The submitted investigation data shows it has not. The track design is explicitly deferred to a specialist who has not been appointed. The drainage drawings are generic and flood-blind. An EIAR that contains these gaps for the most sensitive zone of the development does not meet the legal standard. This is a failure of substance, not detail, and it cannot be cured by condition.

Source: Appendix 8-1A (TP08, TP09); Appendix 8-1C (BH02); Appendix 8-2, Appendix 3 (Assessment Areas 8 and 9), Section 7.1; Appendix 8-3, pp.9–13, Table 2-2; FRA App.9-3, p.23; SWMP App.9-4, pp.19–20; Drawings 11333-2033, 11333-2034, 11333-2061 to 11333-2065

3.10 Ground 7 — Construction Loading and Floodplain Compaction: An Unassessed Effect

The proposed development sits on the active floodplain of the Little Brosna for four of its eleven turbines (T1, T2, T8, T9) and for much of the associated access track network. The construction of those turbines and the tracks that serve them will impose large, sustained loads on saturated floodplain peat and peat-over-soft-silt sequences: turbine cranes and their counterweights during erection, hardstand loadings during construction and operation, founded-road embankments excavated through peat to a competent stratum, floating-road sections supported by geogrid on the peat itself, and excavated material temporarily mounded in the peat deposition area pending reuse. None of those loads has been assessed for its effect on the absorptive function of the floodplain on which they sit. The Flood Risk Assessment is, as per the Hydro-G expert report, "site-specific" in the narrow sense that it considers risk to the developer's own infrastructure and does not categorically assess flood risk to the adjacent Sharavogue Bog SAC (Hydro-G Report, Appendix 3-1, S5). The construction-induced mechanism by which floodplain compaction increases flood risk to third-party lands and to the designated site — distinct from the fluvial flood risk to the development assessed at Ground 5 above — is therefore wholly absent from the application.

This is not a complaint about specific load figures or specific compaction magnitudes. The Hydro-G report offers indicative loadings for the Inspector's consideration; the applicant has provided no lift study, no ground-pressure assessment and no compaction modelling of any kind, so the specific magnitudes cannot be verified from the application and are not relied upon here. What can be stated without qualification is that the loads have not been assessed, and that the FRA does not address them. The ground is an EIA assessment-gap ground, not a quantitative-impact ground.

3.10.1 Floodplain Function Depends on the Compressibility of Saturated Peat

The hydrological function of a floodplain in absorbing peak fluvial flows depends on the pore space and storage capacity of the saturated material that comprises it. On the

Ballincor site, that material is recorded by the applicant's own investigation as soft to very soft peat overlying very soft organic silts and clays. The PSRA (Appendix 8-2, p.21) records a median peat moisture content of 774% and 9 of 12 trial pits collapsing during investigation; BH02 records 12.8 m of SPT N=0 silt and clay beneath the peat at T9, with the sampler penetrating under its own weight throughout that column (Appendix 8-1 C, BH02). Saturated peat of this kind is highly compressible: it absorbs water during flood inundation and releases it as inundation recedes, and its compressibility is the property that allows it to provide floodplain storage.

That property is lost under sustained construction loading. Compaction of saturated peat reduces pore space and destroys storage capacity; once compacted, peat does not recover its original structure on the timescale of the development's operational life. The hydrological consequence is a reduction in the absorptive capacity of the floodplain along the loaded corridors, which in turn translates into higher peak flood levels for the same fluvial flow — the inundation modelled by the FRA at the 1% AEP and MRFS scenarios is calculated against the floodplain's *uncompacted* hydrological function. The applicant has not modelled the post-construction floodplain function. It has not modelled the construction-phase compaction. It has not modelled the consequent change to flood extent at T1, T2, T8, T9 or downstream.

3.10.2 The Cranes, the Hardstands and the Access Tracks

The loading sources are not theoretical and not optional. The construction of turbines of the proposed scale requires heavy lift cranes and their counterweights, operating from hardstands constructed to support those loads. The independent review notes that hardstanding for the crane is likely to require thicker crushed stone, possibly geotextile and timber or steel mats to distribute loads, and that the crane's outriggers (or tracks, if crawler) will impose high ground pressure on the hardstand surface (Hydro-G Report, Appendix 3-1, S5). In a flood-zone wetland setting, those works require a full engineering lift study, enhanced ground-bearing provision and load-distribution measures designed for the specific saturated-substrate conditions on this site.

The application contains none of those documents. There is no lift study. There is no ground-pressure assessment. There is no load-distribution specification at T1, T2, T8 or T9 — the four turbines in Flood Zone A/B — beyond a generic hardstand detail applied uniformly across the site. The independent review confirms the same omission: the facts of how crane and ballast weights will impact the drainage systems are not assessed, and the omission presents a health hazard and risk to the public and to the WFD objectives for waterbodies in the catchment (Hydro-G Report, Appendix 3-1, S5).

The access track network compounds the loading footprint. The SPMP (Appendix 8-3, pp.9–13) describes founded tracks excavated to competent stratum, with floating tracks used where peat exceeds 1 m. Both options impose construction loading on the floodplain peat: founded tracks through excavation and embankment construction, floating tracks through direct geogrid loading of the peat surface. The published evidence on wind-farm hydrological impact identifies the access road network — not the turbine bases — as the dominant hydrological pressure on peat (Lindsay 2010, 2016; Chico et al. 2023, *Scientific Reports* 13:4540). The applicant's own SPMP describes both founded and floating road typologies but does not assess the compaction signature of either against the floodplain function on which the FRA modelling depends.

3.10.3 Piles Driven into a Stratum That Was Not Identified

The compaction issue compounds with a related ground-conditions failure that the application leaves unassessed: the piles on which the turbine foundations in this corridor depend are designed against a founding stratum that the site investigation did not confirm.

Drawing 11333-2043 (Turbine Foundation Details — Piled) shows the piled foundation in section. The pile cap/foundation depth is shown as 3.6–4.0 m below the turbine base platform. The drawing note states "*Top of foundation level varies.*" With platform levels raised to 46.5 mOD and the surrounding ground at approximately 44–46 mOD in the T8/T9 valley floor (as shown on the drainage layout contours), the actual excavation

from existing ground level to the base of the pile cap would reach 5–6 m+ depth before the piles themselves begin.

Fifty to seventy 300 × 300 mm precast concrete square piles are specified around the perimeter of a 24–26 m diameter base. Each pile must be driven or bored through the full peat column and then through the 12 m+ of SPT N=0 silt and clay confirmed in BH02 to reach the dense gravel at 15.80–18.80 m below ground level. The drawing carries no specification of pile length, no statement of load-bearing stratum depth, and no note that the founding conditions have been confirmed by the site investigation. Drawing notes 1 and 2 state that *"orientation varies as multiple instances on site"* and *"top of foundation level varies"* — indicating a single generic detail applied to all eleven turbine locations regardless of the dramatically different subsoil profiles between, for example, T10 (which has competent material near surface) and Tg (SPT N=0 to 12.80 m).

The hydrological significance of this is not the structural risk to the turbine itself — that is addressed at Ground 6 (Access Tracks) and Ground 8 (Peat Stability). The hydrological significance is that the pile-driving and load-transfer process disturbs the entire vertical column of saturated peat and underlying soft silt at each of the eleven turbine locations, and that the cumulative footprint of this disturbance across the four floodplain turbines has not been modelled for its effect on either the floodplain function or the downstream water table. Each pile creates a vertical pathway through the peat and into the underlying silt; piling-induced consolidation alters the pore pressure regime in the surrounding saturated material; and the construction loads applied to the pile-supported platform compress the surrounding ground over a wider footprint than the pile group itself. None of those effects has been characterised.

3.10.4 The FRA's Site-Specific Framing Does Not Reach the SAC

The Flood Risk Assessment (Appendix 9-3) models risk to the developer's own infrastructure under existing and Mid-Range Future Scenario conditions. It does not model the effect of the development on the floodplain. The Hydro-G report identifies the framing failure expressly: as is the case with most renewable energy projects, the

FRA is site-specific in the sense that it considers the risk posed to the developer's own infrastructure and does not categorically assess flood risk to the Conservation Objective Sharavogue Bog SAC site adjacent (Hydro-G Report, Appendix 3-1, S5).

The asymmetry matters because the floodplain on which the development is proposed drains, in flood conditions, toward Sharavogue Bog SAC and the lagg zone at the eastern margin of the wind farm site. Ground 5 above establishes that under the Mid-Range Future Scenario T9 is 75% inundated, T1 is 40% inundated, and the R492 access track along the river is fully submerged. The same modelling does not address how the floodplain delivers that water to its downstream destinations once the compaction footprint of eleven turbine pads, three borrow pits, nineteen settlement ponds, the substation, the BESS, the peat deposition area and the access track network has reduced the absorptive capacity of the corridors through which the water moves.

A construction-induced mechanism capable of increasing flood risk to third-party lands, public roads and a Priority Habitat SAC, on a site whose own modelled flood extent already reaches the SAC interface, is a credible pathway of effect on a European site within the meaning of Article 6(3). That pathway has not been assessed.

3.10.5 Legal Standard and Conclusion

The EIA Directive (2014/52/EU) requires that an EIAR identify, describe and assess the likely significant effects of a project on the environment, including effects from construction. Construction loading on a floodplain that causes compaction of saturated peat and a consequent reduction in floodplain capacity is, on the published evidence, a foreseeable effect of a project of this type and scale on a substrate of this character. An EIAR that does not assess such an effect on a site within Flood Zone A/B, adjacent to a Priority Habitat SAC, does not discharge the competent authority's EIA duty.

The Habitats Directive Article 6(3) duty is engaged in addition. Under CJEU Case C-461/17 (*Holohan*, 2018, para.44), the Appropriate Assessment must contain complete, precise and definitive findings, free of lacunae, on every credible pathway of effect on the qualifying interests of every European site potentially affected. Sharavogue Bog SAC has been identified by the applicant's own NIS Table 6-1 (p.118) as connected to the proposed development by hydrological pathways. Construction-phase floodplain compaction is a credible pathway of effect on the hydrology of the SAC's interface zone, distinct from the dewatering and direct-drainage effects addressed at Grounds 10 and 11 below. It has not been assessed. Under CJEU Case C-323/17 (*People Over Wind*, 2018), the absence of assessment cannot be cured by assumption that mitigation will operate to prevent the effect; the mitigation must be assessed in the NIS itself, and it has not been.

This is a gap to be filled before consent, not a matter that can be remedied by post-consent condition. The construction loadings, the compaction mechanism, the pile-foundation impact and the floodplain-function consequence are all design-stage matters that bear directly on whether the project should be authorised in this location. An assessment that does not address them does not contain the information necessary to support a no-adverse-effect conclusion under Article 6(3), nor to discharge the competent authority's EIA duty under the EIA Directive.

Source: FRA App.9-3; EIAR Ch.9; SPMP App.8-3 pp.9-13; PSRA App.8-2 p.21 and Appendix 3-1 C (BH02); CEMP App.2-3 p.11; Planning Drawings 11333-2043 (Turbine Foundation Details — Piled), 11333-2033 (Track Construction Details); NIS Table 6-1 p.118; Lindsay (2010, 2016); Chico et al. (2023) Scientific Reports 13:4540; EIA Directive 2014/52/EU; CJEU C-461/17 (*Holohan*, 2018) para.44; C-323/17 (*People Over Wind*, 2018); Hydro-G Report, Appendix 3-1, S5.

3.11 Ground 8 — Peat Stability: Contradicted Data, Deferred Mitigation, and the Meenbog Precedent

The peat stability assessment on which the application relies is internally contradictory, structurally incomplete, and depends for its headline "Negligible" rating on a temporary works design that has not been prepared. The applicant's own peat stability assessor states on the face of the document that further site investigation, in situ testing and laboratory testing are required before detailed design can proceed (PSRA Appendix 8-2 S7.1). The peat slide contingency plan is conditional in its operative language. And the EIAR conclusion that significant effects are not anticipated, conditional on construction in accordance with best practice and mitigation, is precisely the form of conclusion that failed at Meenbog in November 2020.

Under CJEU C-258/11 (Sweetman, 2013, para.43), reinforced by Holohan (C-461/17) and 'People Over Wind' (C-323/17), mitigation must be sufficiently identified and assessed at the point of consent, not deferred to detailed design or to a specialist who has not been appointed. An assessment that defers its primary control measure to post-consent design, on a site whose own raw data records 9 of 12 peat trial pits collapsing during investigation, does not discharge that obligation. Each strand of the failure is addressed in turn below.

3.11.1 What the Raw Data Shows

The ground investigation (Appendix 8-1) encountered peat at 12 of the 23 trial pit locations, from near-surface to 3.80 m below ground level, with groundwater struck in the majority of pits at 1.50–3.10 m bgl. Most significantly, sidewall collapse or spalling was encountered in 9 of the 12 trial pits where peat was present (PSRA, Appendix 8-2, p.19), and multiple pits were physically terminated before reaching target depth. The investigation is therefore incomplete at the locations of greatest concern.

The applicant's own PSRA acknowledges the implication of this finding directly: *"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"* (Appendix 8-2, p.22). "Likely to probable" is not a residual or marginal risk profile. It is the baseline against which the post-mitigation Negligible rating addressed below must be tested.

Source: Appendix 8-1 (TP-series logs); Appendix 8-2 (PSRA) pp.19, 22.

3.11.2 The SPMP Contradicts the Site Investigation Data

The SPMP (Appendix 8-3, S1.2.1, p.4) characterises the peat as having "a relatively low moisture content and high shear vane values", "fibrous and relatively easy to manage," with no evidence of instability noted on the site. The PSRA's own laboratory data directly contradicts this. Ten moisture content tests were carried out on peat samples. The moisture content ranged from 44% to 946%, with a median of 774% (Appendix 8-2, p.21). A median moisture content of 774% is not low by any geotechnical standard — it is the characteristic of saturated, near-fluid peat. The PSRA's narrative confirms 9 of 12 peat trial pits collapsed during testing. The SPMP's characterisation of the peat as "easy to manage" is directly contradicted by the geotechnical data in the sister document filed as part of the same application.

EIAR Chapter 8 (S8.3.1.8, p.21) similarly states there are "no known peat instability issues within the proposed wind farm site" and characterises the effects as "slight/not significant" (S8.4.2.5, p.35). These statements are directly contradicted by the PSRA's raw data. Three documents in the same application disagree with the fourth on the same basic factual question. The reader is left without a single, coherent account of the material the application proposes to excavate, load, and build on.

Source: SPMP Appendix 8-3 S1.2.1 (p.4); PSRA Appendix 8-2 (pp.19, 21); EIAR Ch.8 S8.3.1.8 (p.21), S8.4.2.5 (p.35).

3.11.3 The Negligible Rating Depends on Mitigation That Does Not Exist

The PSRA summary table (Appendix 8-2, Table 7) records eight assessment areas at "low" risk before mitigation and all areas at "negligible" after. The post-mitigation Negligible rating is the basis on which the application proceeds. It does not survive close reading.

T4, T8 and T9 carry the three highest raw hazard scores on the site — 107, 91 and 105 respectively (PSRA Appendix 3, Risk Registers, Areas 4, 8 and 9). The position at T9 is particularly significant for the receiving environment. The PSRA's quantitative stability outputs (Appendix 8-2, Appendix 3-2) return an undrained factor of safety (ODF Case 2) of 3.4, (the second-lowest on the site after T4's 1.8) on 12.8 m of soft material (BH02 records SPT N=0 to 12.8 m). T9's position 50–100 m from the Little Brosna and the Sharavogue Bog SAC places it in the worst combination of stability risk and receptor proximity on the site. The Hydro-G report

identifies the same vulnerability from the field-vane data and confirms T9 as a focal point of concern (Appendix 3-1, S4.3).

The post-mitigation Negligible rating for each of T4, T8 and T9 depends on a single identical control measure (PSRA Appendix 3, Risk Registers, item 4): *"Due to size of excavation and likelihood it will be open for a long time, specific temporary works design required including temporary slope stability measures, e.g. rock berm, shallow slope angles, daily inspections."*

That specific temporary works design does not exist in the application. The Chapter 20 Schedule of Mitigation Measures contains no such design — Measure 24 commits to a geotechnical risk register, a generic granular berm or sheet piles, backfilling to ground level, and a prohibition on excavating in severe weather. That is the committed peat stability framework, in full, for a site where 9 of 12 peat trial pits collapsed during investigation.

The applicant's own technical team confirms on the face of the documents that the framework is incomplete. PSRA S7.1 recommends *"additional site investigations inclusive of in situ testing and laboratory testing in specific risk areas on the site"* before detailed design can proceed. The SWMP (Appendix 9-4, p.1) describes itself as *"a Planning Stage document ... subject to further revision following Planning Permission and the Detailed Design Stage."* Consent is being sought on documents the applicant's own assessors say are not yet sufficient to support the design.

The Scottish Government (2017) framework adopted by the PSRA defines Negligible as meaning a project should *"proceed with monitoring and mitigation as appropriate"* — a designation that presupposes the mitigation has been identified and is capable of implementation. On the application as submitted, the mitigation that delivers the Negligible rating has not been identified, and the applicant's own assessors say it cannot yet be designed. Under CJEU C-258/11 (*Sweetman*, 2013, para.43), reinforced by *Holohan* (C-461/17) and by domestic authority including *Kelly v An Bord Pleanála* and *Eco Advocacy v An Bord Pleanála*, mitigation must be sufficiently identified and assessed at the point of consent. A deferred temporary works design, conditional on further investigation that has not been carried out and on a specialist who has not been appointed, cannot underpin a Negligible classification.

Source: PSRA Appendix 8-2 S7.1, Table 7, Appendix 3-2 (stability outputs), Appendix 3 (Risk Registers Areas 4, 8, 9); SWMP Appendix 9-4 p.1; EIAR Ch.20 Schedule of Mitigation Measures (Measure 24); Scottish Government (2017) Peat Landslide Hazard and Risk Assessments, Best Practice Guide; Hydro-G Report, Appendix 3-1, S4.3; CJEU C-258/11 (*Sweetman*, 2013) para.43; C-461/17 (*Holohan*, 2018) para.44.

3.11.4 The Peat Slide Contingency Plan Is Inadequate

The SPMP (Appendix 8-3, S4, p.18) responds to a peat slide event by stating that "where considered possible" action will be taken to prevent a slide reaching a watercourse, in the form of check barrages on land. There is no engineering specification for the barrages, no defined response time, no pre-positioned equipment, and no assessment of whether a barrage can be constructed in the T8/T9 flood zone — 50–100 m from the Little Brosna — before a slide reaches the river. The phrase "where considered possible" places the primary obligation on a contingency condition rather than a guaranteed measure.

For a site where T9 carries a pre-control hazard score of 105, is 75% inundated under the MRFS climate uplift adopted in the applicant's own FRA, and sits 50–100 m from the SAC boundary, a conditional "where considered possible" response is not an adequate contingency. The mechanism that would actually need to function — emergency barrage installation in the flood corridor, in conditions where the river itself is likely to be approaching or exceeding bank-full — is not designed, not specified and not tested. The plan is an aspiration, not an engineering response.

Source: SPMP Appendix 8-3 S4 (p.18); FRA Appendix 9-3; Hydro-G Report, Appendix 3-1, S4.3, S5.*

3.11.5 The Meenbog Precedent: "Trivial and Tolerable," Proven Wrong

The Hydro-G report supplies a recent and directly instructive precedent on the unreliability of best-practice assurances of peat stability (Appendix 3-1, S6). At the Meenbog wind farm in Co. Donegal, the 2017 EIAR concluded that "No significant impacts on the soil and geology of the site of proposed development will occur," qualified by the further statement that "A peat stability assessment undertaken for the site shows that the risk of peat failure is designated trivial and tolerable and that the site has an acceptable margin of safety." In November 2020 the land slid: a civil and environmental engineering report to the EPA estimated that approximately 86,240 m³ of peat moved, of which approximately 65,740 m³ entered a river and reached European-protected sites, causing significant environmental damage. Donegal County Council secured an order prohibiting further works, and in April 2024 Mr Justice Holland restrained the developers from completing the "largely complete" 19-turbine project, finding that the integrity of the planning and environmental law system weighed heaviest and that the public interest in wind energy weighed "much at all" little in the balance (Irish Times, 11 April 2024; Donegal Daily, 12 April 2024; ABP Case 300460). Hydro-G further records, applying the National Trust for Scotland (2024) factor of 172 kg CO₂e per cubic metre of peat, that the

86,240 m³ slide equates to the destruction of a carbon sequestration asset equivalent to approximately 14.8 million kg of CO₂ — a figure that bears directly on the Maladaptation ground later but stands here as a measure of scale.

The lesson is directly applicable. The Meenbog EIAR's central conclusion — that, *conditional on construction in accordance with the design, best practice and mitigation described in the application documents, significant individual or cumulative effects on ecology are not anticipated* — is the standard template used in EIARs for wind turbine plantations on Irish peat. It is the same *conditional-best-practice* template used in the Ballincor EIAR. The Meenbog outcome demonstrates that the conditional template cannot be relied upon: best practice and mitigation as described in the application did not protect the receiving European-protected sites.

The position, that one cannot rely on best construction practice and mitigation to protect Conservation Sites, is consistent with the most recent Irish case law on the point (Hydro-G Report, Appendix 3-1, S6). Deep excavations in saturated cutover peat adjacent to an active drainage network and a Poor-status river require a detailed, site-specific contingency, not a conditional aspiration.

Source: Hydro-G Report, Appendix 3-1, S6; ABP Case 300460 (Meenbog Windfarm); Irish Times (11 April 2024); Donegal Daily (12 April 2024); National Trust for Scotland (2024); CJEU C-261/18 Commission v Ireland (12 November 2019); Lindsay & Bragg (2005).

3.11.6 Legal Standard and Conclusion

Under Article 6(3) of the Habitats Directive, the competent authority may grant consent only after ascertaining, beyond reasonable scientific doubt, that the project will not adversely affect the integrity of the European site (Case C-127/02 Waddenvereniging, 2004). Adverse effect on integrity includes any impact that prevents the lasting preservation of the site's constitutive characteristics (Case C-258/11 Sweetman, 2013, para.43). The assessment must contain complete, precise and definitive findings free of lacunae (Case C-461/17 Holohan, 2018, para.44). Mitigation measures must be sufficiently identified and assessed within the assessment itself; they cannot be assumed to work and cannot be deferred to post-consent design (Case C-323/17 *People Over Wind*, 2018). Domestic authority — including *Kelly v An Bord Pleanála* and *Eco Advocacy v An Bord Pleanála* — applies the same standard.

The Ballincor peat stability case fails each limb of that test. The raw site investigation data records short-term excavation instability as "likely to probable" in the absence of mitigation. The SPMP characterisation of the peat as "easy to manage" is contradicted by the PSRA's own moisture-content and collapse data and by EIAR Chapter 8's parallel "no instability" assertion. The post-mitigation Negligible rating at the three highest-scoring turbine locations (T4, T8, T9) turns on a single deferred control measure — a "specific temporary works design" that does not exist in the application — and the PSRA itself states at S7.1 that further site investigation, in situ and laboratory testing are required before detailed design can proceed. The peat slide contingency plan is conditional in its operative language ("where considered possible") and contains no engineering specification capable of being assessed. And the closest factual precedent in Irish wind-on-peat development — Meenbog, with an EIAR conclusion of "trivial and tolerable" risk that the ground proved wrong in November 2020 — establishes that a conditional-best-practice assurance is not a substitute for designed mitigation in an Article 6(3) assessment.

An Article 6(3) determination of no adverse effect on integrity, in respect of a priority habitat SAC immediately adjacent to a site where 9 of 12 peat trial pits collapsed during investigation and the highest-scoring turbines rely on an undesigned temporary works specification, does not satisfy the standard set by Waddenvereniging, Sweetman, Holohan and People Over Wind. The applicant has waived Article 6(4) IROPI (NIS p.4). Full Article 6(3) compliance must be demonstrated on the application as submitted. On the peat stability question, it is not.

Source: CJEU C-127/02 (Waddenvereniging, 2004); C-258/11 (Sweetman, 2013) para.43; C-461/17 (Holohan, 2018) para.44; C-323/17 (People Over Wind, 2018); Kelly v An Bord Pleanála; Eco Advocacy v An Bord Pleanála; PSRA Appendix 8-2 S7.1, Tables 3 and 7, Appendices 2 and 3; SPMP Appendix 8-3 S1.2.1, S4; EIAR Ch.8 S8.3.1.8, S8.4.2.5; EIAR Ch.20 (Measure 24); Hydro-G Report, Appendix 3-1, S4.3, S6; full reference list at Appendix [X] of this submission.

3.12 Ground 9 — The Shinrone Groundwater Body and Karst Risk

The proposed wind farm site is located predominantly within the Shinrone Groundwater Body (GWB, code IE_SH_G_205). Appendix 9-1 (p.12) records that a limited area of Pure Bedded Limestone in the northern part of the GWB is classified as Rkd — a Regionally Important Karstified Aquifer dominated by diffuse flow. EIAR Chapter 9 (Table 9-12) confirms the same Rkd classification for the Terryglass Formation and Visean Limestones underlying part of the site.

Karst limestone is characterised by dissolution features — sinkholes, solution pipes and conduits — that can be concealed beneath peat and glacial deposits. Their significance here is twofold: open excavations that penetrate through peat into the karst substrate create a direct vertical pathway between surface contamination and the aquifer; and the Shinrone GWB connects hydraulically to Sharavogue Bog SAC, which is designated for groundwater-dependent habitats.

The entirety of the karst risk assessment in the submitted application is a single sentence in EIAR Chapter 8 (p.8-35): "No karst was identified during the site walkovers." A walkover survey over peat and cutover bog cannot identify sub-peat dissolution features.

In EIAR Chapter 8, Section 8.3.1.7 Geohazards, page 8-21, the applicant acknowledges "While karst features have not been encountered within the proposed wind farm site boundary, it is possible that karst features (highly weathered zones) are located below the proposed wind farm site extents which have not been identified due to the thick cover of peat and subsoils." No geophysical investigation or no specialist dissolution feature assessment was carried out.

The applicant relies on the GSI groundwater vulnerability classification, under which the site is mapped as predominantly "low vulnerability." That classification is misleading in this context. The low-vulnerability rating is a direct function of the depth of peat overlying the bedrock — it is the peat itself that provides the protective barrier. Critically, vulnerability under the GSI methodology is assessed against a surface-level pollution event percolating downward through an intact soil profile. It is not assessed against the scenario this development creates. The installation of access tracks, turbine foundations and cable trenching will excavate through that protective peat layer, removing the very material on which the low-vulnerability classification depends. Once the peat is cut, foundations are piled and trenches are opened, a direct vertical pathway is created from the works into a Regionally Important Karstified Aquifer, bypassing the natural attenuation the classification assumes. The assessment therefore applies a protective rating to a site condition that the project is designed to destroy.

This analysis is supported by the independent hydrogeological review prepared by Dr Pamela Bartley (Hydro-G, June 2026), whose doctorate is in karst groundwater impact and whose field practice is built on the Source–Pathway–Receptor risk-assessment model — the same framework the applicant purports to apply in EIAR Chapter 9. Dr Bartley's review identifies the GSI-mapped pocket of gravels and the connected esker within the application area as a hydrogeological "window" through which groundwater more readily emerges from the underlying bedrock, noting that a peat-to-gravel boundary is a recognised setting for groundwater emergence and that the mapped terminus of the esker coincides with the commencement of a surface-water system. Her reasoning reinforces the central objection advanced here: that the protective function on which the GSI low-vulnerability rating depends is a property of the intact subsoil profile, and that the development is designed to remove precisely that profile at the points of greatest hydrogeological sensitivity. Where the applicant's vulnerability assessment treats the mapped subsoil cover as a fixed protective barrier, Dr Bartley's review confirms that the construction works — excavation through peat and subsoil, and the imposition of construction loads at the margin of the gravel/esker feature near T1 to T4 — will alter the very subsurface conditions the classification assumes to be stable.

An independent specialist in karst hydrogeology has therefore reached the same conclusion as this submission: the application applies a protective rating to a site condition that the proposed works are designed to destroy, in a setting where a regionally important karstified aquifer (Rkd) lies beneath, and does so without the dissolution-feature or connectivity assessment that the setting requires.

Source: Bartley, P. (Hydro-G, Appendix 3-1), EIAR Ch.8 Section 8.3.1.3 (p.8-13), Section 8.3.1.7 (p.8-21); EIAR Ch.9 Table 9-12; Appendix 9-1 (p.12).

3.13 Ground 10 — Hydrogeological Connectivity to Sharavogue Bog SAC: Unbridged Lacuna in the Appropriate Assessment

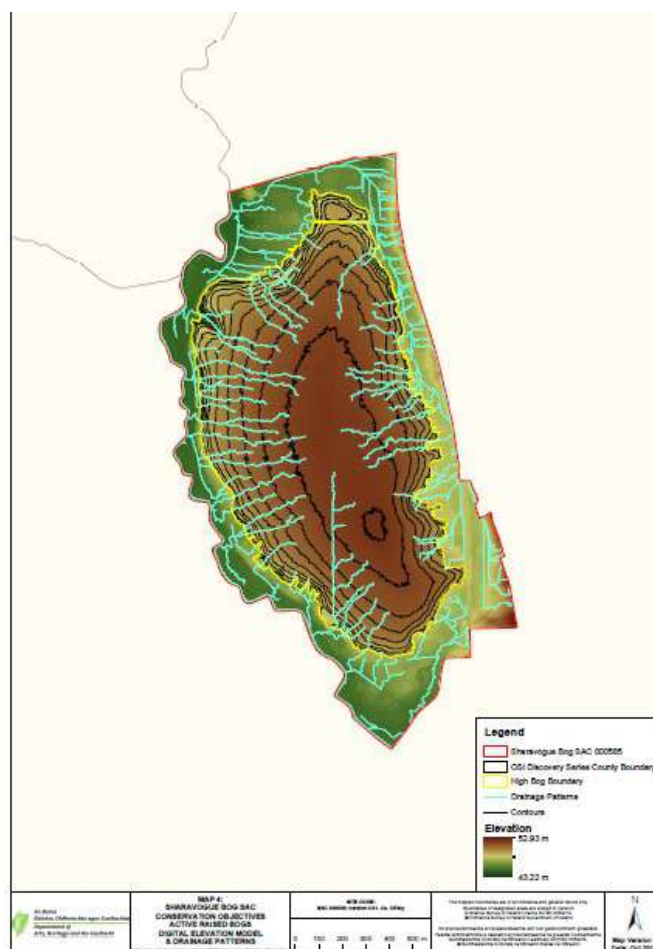
Sharavogue Bog SAC sits approximately 10 m from the proposed wind farm boundary at its closest point. The site is a Priority Habitat (7110* Active Raised Bog) SAC currently in the most hydrologically sensitive phase of a State-funded restoration programme. The fundamental threshold question for the Article 6(3) determination is whether there is a hydrogeological pathway between the development and the SAC. If such a pathway exists, the source–pathway–receptor chain is established, the construction works become potential drivers of effect on integrity, and the certainty required by *Waddenzee* / *Waddenvereniging* cannot be reached without quantitative engagement with that pathway.

The applicant concludes there is "no hydrogeological connection" to the SAC. That finding is presented at Appendix 9-1 S2.2, supported by the assertion that the Shinrone GWB is only a Locally Important Aquifer (LI) and that flow paths are short, and reproduced in NIS Table 6-2 (p.120) as the basis on which "no potential for adverse effects" was identified.

The "no connection" finding is not supported by the evidence on the applicant's own submission file. It is contradicted by the NIS's own connectivity assessment (Table 6-1), by the applicant's own EIAR record of physical evidence at the eastern margin, and by the GSI subsoil mapping inside the applicant's own red line. Two distinct hydrogeological pathways are documented in the application file. Neither has been characterised in the assessment. All are reviewed below. The applicant's conclusion of "no adverse effect on integrity" therefore rests on an unbridged lacuna of the kind that CJEU C-461/17 (*Holohan*, 2018, para.44) expressly prohibits.

3.13.1 The Vanishing Pathway: Table 6-1 to Table 6-2

NIS Table 6-1 (p.118) explicitly identifies hydrological connectivity to Sharavogue Bog SAC via the Little Brosna_040 and drainage ditches and records a groundwater pathway via the Shinrone groundwater body to a SAC designated for groundwater-dependent habitats: "a potential for adverse effect was therefore identified." This conclusion is strongly supported by the image below.

Figure 3.17: Sharavogue Bog Hydrological Connectivity

NIS Table 6-2 (p.120) then states under Water Quality: "No pathway to impact on these parameters was identified from the proposed project and so there is no potential for adverse effects."

No mitigation measure, engineering control, or changed hydrogeological assumption bridges these two conclusions. The groundwater pathway identified in Table 6-1 disappears in Table 6-2 without explanation. This is the lacuna that CJEU C-461/17 (*Holohan*, 2018, para.44) prohibits: an Appropriate Assessment must contain complete, precise and definitive findings free of gaps. The independent review reaches the same conclusion, identifying the source-pathway-receptor chain as established and the information before the Commission as contradictory (Hydro-G Report, Appendix 3-1, S4.2).

A further inconsistency arises within EIAR Chapter 9 itself. Table 9-13 (p.9-35) records Sharavogue Bog SAC — immediately adjacent at 0.1 km — as having "limited" hydrological connectivity, while confirming full hydrological connectivity to the downstream SPAs and

SACs via the same watercourse. The qualifier "limited" applied to the closest site but not to sites 9–20 km downstream is unexplained and unsupported.

The gap between Table 6-1 and Table 6-2 is not merely a logical inconsistency on the page. On the ground, two distinct hydrogeological pathways physically connect the wind farm site to Sharavogue Bog SAC. The first is the near-surface acrotelm pathway, evidenced by the applicant's own record of calcareous fen upwelling at the eastern margin — a pathway the applicant has failed to characterise (S3.10.2 below). The second is the mapped gravel-and-esker window lying within the proposed red-line application area, which the applicant has circled out and excluded from the assessment area (S3.10.3 below). For Table 6-2 to stand, both pathways would have had to be characterised and ruled out. Neither has been.

Source: NIS Table 6-1 (p.118); NIS Table 6-2 (p.120); EIAR Ch.9 Table 9-13 (p.9-35); CJEU C-461/17 (Holohan, 2018) para.44; Hydro-G Report, Appendix 3-1, S4.2.

3.13.2 First Unassessed Pathway: The Near-Surface Acrotelm

The applicant's case for "no connection" relies on the bedrock aquifer being a Locally Important Aquifer with low transmissivity (Appendix 9-1 S2.2). The bedrock aquifer is not the dominant pathway. Surface and near-surface flow within the cutover/lagg fringe of Sharavogue Bog — the precise zone where the wind farm site meets the SAC — is the realistic pathway. It is governed by acrotelm hydraulic conductivity, not bedrock permeability.

Direct physical evidence of this pathway is in the applicant's own submission. EIAR Chapter 9 (p.9-34) records calcareous fen vegetation on the eastern margin of the wind farm site — the interface zone between the site and Sharavogue Bog SAC: "...along the eastern margin of the proposed wind farm site, fen peat is present and there is upwelling of base rich water that supports carr woodland and calcareous fen vegetation."

Calcareous fen occurs only where base-rich groundwater upwells at or near the surface. Its presence at the interface between the wind farm footprint and the SAC is direct physical evidence of near-surface groundwater connectivity flowing from the wind farm area toward the SAC. The evidence is in the applicant's own submission. It was not engaged with in the NIS integrity assessment.

What that calcareous fen connects to on the eastern margin of Sharavogue Bog is the central reason this matters. The NPWS documentation records the lagg zone at Sharavogue — the

transitional fringe of upwelling base-rich groundwater supporting carr woodland and calcareous fen vegetation — as one of the best developed in the country, and unique in the context of Irish raised bogs. Areas of wet lagg vegetation of this character are described as very rare in Western Europe. This is not a peripheral feature of the SAC. It is the primary element of local distinctiveness formally identified in the NPWS Site Synopsis. It is entirely dependent on the interactions between groundwater, surface water, and adjacent land use — making it inherently sensitive to precisely the kind of near-surface hydrological disturbance that the applicant's own EIAR records as present at the site boundary.

The Hydro-G report (Appendix 3-1) provides further geological corroboration that the near-surface system is connected across the boundary. The GSI subsoil mapping records the same material — "Cut over raised peat" — on both banks of the Little Brosna, so the river hydrologically links identical subsurface systems on either side rather than separating them, binding the development lands and Sharavogue Bog SAC into one connected unit (Hydro-G Report, Appendix 3-1, S1, S4.4). The river is not a flow boundary; it is a conduit through a single connected acrotelm system.

The applicant's own Spoil and Peat Management Plan (Appendix 8-3, S1.2) describes the upper peat profile as acrotelm — the living layer, generally of high permeability, in which the water table fluctuates and through which the dominant lateral water movement in raised bogs occurs. The applicant's description of the acrotelm is correct; it is then ignored. The hydrogeological assessment proceeds as if the bedrock aquifer were the only pathway and concludes "no connection" on that basis.

The 100 m Zone of Influence used by the NIS (S5.2.1.3) is derived from bedrock aquifer modelling. This is the wrong model for the near-surface peat water table system responsible for the upwelling. Peat water tables are shallow, laterally mobile, and directly responsive to drainage modification. A ZoI derived from bedrock aquifer behaviour cannot assess near-surface peat water table effects in this interface zone. (The independent contradiction of the 100 m ZoI value itself by the published Irish field evidence is addressed at Ground 8 S3.11.3 below.)

Source: EIAR Ch.9 p.9-34; Appendix 9-1 S2.2; Appendix 8-3 S1.2; NPWS Site Synopsis: Sharavogue Bog SAC 000585 (2017); NIS Table 6-1 and Table 6-2; NIS S5.2.1.3; Hydro-G Report, Appendix 3-1, S1, S4.4, S4.2.

3.13.3 Second Unassessed Pathway: The Excluded Gravels and Esker

The Hydro-G report (Appendix 3-1) identifies a second documented pathway; a mapped granular hydrogeological feature, a pocket of Gravels and a connected Esker lying within the proposed red-line application area, which the applicant has circled out and treated as excluded. This represents a distinct, qualified hydrogeological pathway. Its significance is hydrogeological, not cartographic: a peat-to-gravel boundary is a recognised setting for groundwater emergence, and the applicant's own cited authority (GSI, 2003b) identifies the Birr gravels as capable of focusing flow and influencing the location of springs. This feature is sufficiently distinct, and the failure to assess it sufficiently serious, that it is addressed as a separate ground at **S3.14** below.

For the purposes of this ground, the point is narrow but decisive: for the Table 6-2 conclusion of no hydrogeological connection to stand, **both** documented pathways — the near-surface acrotelm pathway evidenced at the eastern margin (§3.13.2 above) and the excluded gravel-and-esker window (§3.14 below) — would have had to be characterised and ruled out. Neither has been. The conclusion of "no adverse effect on integrity" therefore rests on an unbridged lacuna of the kind that CJEU C-461/17 (*Holohan*, 2018, para.44) expressly prohibits.

3.13.4 Receptor Sensitivity: Sharavogue Bog in Active Restoration

The connectivity question takes on particular force because of the state of the receptor. Sharavogue Bog SAC is not a static system in stable condition. The site is in the most hydrologically sensitive phase of a State-funded restoration programme. Over 400 rewetting dams were installed in 2021. 26.4 km of drains — 90% of those identified as requisite — have been blocked. Water tables across the SAC are higher than at any point since restoration began. Peat-forming conditions are being actively re-established.

The formal conservation objective is to restore Active Raised Bog from 25.8 ha to 40.9 ha — a target that remains unmet. Slender Cottongrass (**Eriophorum gracile**), a Flora (Protection) Order 2015 species, is recorded in the lagg, occurring only where a stable base-rich water supply is maintained. Atmospheric nitrogen deposition at the site already stands at approximately 13.2 kg N/ha/yr against a conservation target of 5 kg N/ha/yr — an existing exceedance of 163% above critical load.

The lagg zone is the specific feature most directly exposed by the connectivity failure. The acrotelm pathway evidenced at the eastern margin (S3.10.2 above) discharges into precisely this transitional fringe. The Conservation Objectives for habitat 7110* set quantitative targets in centimetres for water level and define the lagg/transitional area as a specific protected attribute (NPWS, 2015). The hydrogeological pathway that has not been characterised discharges to the very attribute that the Conservation Objectives are designed to protect.

In a system with these characteristics, the level of certainty required to demonstrate no adverse effect on integrity is correspondingly higher, not lower. An assessment that cannot even establish whether the connecting pathways exist cannot discharge the Article 6(3) burden in respect of a priority habitat SAC in active restoration.

Source: NPWS (2015) Conservation Objectives: Sharavogue Bog SAC 000585; NPWS Site Synopsis (2017); App.6-1 S4.2.4; EIAR Ch.10 S10.5.2.

3.13.5 Legal Standard and Conclusion

Under Article 6(3) of the Habitats Directive, the competent authority may grant consent only after ascertaining, beyond reasonable scientific doubt, that the project will not adversely affect the integrity of the European site (Case C-127/02 *Waddenvereniging*, 2004). Adverse effect on integrity includes any impact that prevents the lasting preservation of the site's constitutive characteristics (Case C-258/11 *Sweetman*, 2013, para.43). The assessment must contain complete, precise and definitive findings, free of lacunae, and must dispel all reasonable scientific doubt (Case C-461/17 *Holohan*, 2018, para.44). Mitigation measures cannot be assumed to work; they must be assessed in full within the NIS itself (Case C-323/17 *People Over Wind*, 2018).

The constitutive characteristic of habitat 7110* at Sharavogue Bog SAC is its hydrology, and the lagg zone is the formally identified element of local distinctiveness. Both depend on the maintenance of the near-surface groundwater regime at the site boundary. Whether the proposed development is hydrogeologically connected to that regime is the threshold question for the Article 6(3) determination.

The applicant has answered that question by reproducing a "no connection" finding from a single sentence in Appendix 9-1 S2.2 into NIS Table 6-2, while the applicant's own NIS Table 6-1 records a connecting pathway, the applicant's own EIAR Chapter 9 records physical evidence

of upwelling at the eastern margin, and the applicant's own subsoil mapping records a granular hydrogeological window within the red line. Two distinct physical pathways are documented in the application file. One has been failed to characterise; the other has been excluded from the assessment area by being circled out. The "no connection" finding has been reached without either pathway being assessed.

An Article 6(3) determination of no adverse effect on integrity, in respect of a priority habitat SAC in active restoration, reached without the threshold question of hydrogeological connectivity having been properly addressed, contains the lacuna that "Holohan" prohibits. The applicant has waived Article 6(4) IROPI (NIS p.4). Full Article 6(3) compliance must be demonstrated on the application as submitted. On the connectivity question alone, it is not.

Source: CJEU C-127/02 (Waddenvereniging, 2004); C-258/11 (Sweetman, 2013) para.43; C-461/17 (Holohan, 2018) para.44; C-323/17 (People Over Wind, 2018); NPWS (2015) Conservation Objectives: Sharavogue Bog SAC 000585; Hydro-G Report, Appendix 3-1.

3.14 Ground 11 — The Excluded Gravels-and-Esker Window: A Mapped Groundwater Conduit Left Unassessed

This ground is taken directly from the Hydro-G report (Appendix 3-1). It concerns a hydrogeological feature that the applicant has mapped within its own submission, placed the heaviest construction loading of the project beside, and then removed from the assessment altogether. It is independent of the connectivity contradiction at Ground 10 above: even setting aside the Table 6-1 / Table 6-2 inconsistency, the application contains a mapped granular pathway toward the SAC that has never been characterised, modelled, or ruled out.

3.14.1 The Feature and Its Significance

The independent review identifies a pocket of mapped Gravels and a connected Esker lying within the proposed red-line application area, which the applicant has circled out and treated as excluded (Hydro-G Report, Appendix 1, S1, S4.4, S8(3)). The significance is hydrogeological, not cartographic. Sands and gravels provide a window in the subsoil through which groundwater can more readily emerge from the underlying bedrock; a peat-to-gravel boundary is a recognised setting for substantial groundwater emergence; and the mapped terminus of the esker coincides with the commencement of a surface-water system, which may be a groundwater spring.

The hydrogeological significance of this feature is not a matter of inference. It is stated by the applicant. EIAR Chapter 8 (S8.3.1.3, p.8-13) records that a section in the northeast of the proposed wind farm, approximately 0.4 km east of Turbine 2, comprises glaciofluvial sands and gravels and esker sands and gravels. The same section confirms the subsoil units present include gravels derived from limestones (GLs) and eskers comprised of gravels of basic reaction (BasEsk), described as a pocket of gravels derived from limestone and esker sands and gravels in the northeast of the proposed wind farm. This is a mapped granular deposit set within an otherwise peat- and till-dominated subsoil sequence.

EIAR Chapter 9 (S9.3.3.3, p.9-30) then records, citing GSI (2003b), that the Birr gravels can contribute storage to the bedrock aquifers and can also focus flow and influence the locations of springs in some cases. A body of sands and gravels in this setting is a recognised hydrogeological window: a higher-permeability pathway through which groundwater stored in, or transmitted by, the bedrock can emerge at or near the surface. The applicant's own text identifies eskers and gravels as features capable of focusing flow and controlling spring locations.

3.14.2 Three Points Specific to This Application

First, the feature is granular, not low-permeability. The entire "no connection" case rests on the assertion of deep low-permeability soils and a single, untested hydraulic conductivity of $<1 \times 10^{-8}$ m/s (addressed at Ground 8, §3.11.2(a)–(b)). Sands and gravels are, by definition, not low-permeability material. Their presence within the red-line area is a direct, mapped exception to the uniform low-permeability assumption on which the entire hydrogeological conclusion depends. The applicant cannot apply a site-wide low-permeability conceptual model while its own subsoil mapping records a granular aquifer-type deposit within that same site.

Second, the feature sits at the T1–T4 cluster, where the heaviest construction loading and the highest groundwater vulnerability coincide. The NIS records groundwater vulnerability as High and Extreme, particularly to the north of the wind farm site in the vicinity of T1 (Appendix 1, S4.1.2.3), reflecting bedrock at or within 1 m of the surface. T1–T4 are the turbines on which piling is anticipated through deep peat (Ground 8, §3.11.2(d)), and the borrow pits and turbine foundations in this part of the site will impose construction loads and excavation at the margin of this granular feature. The applicant proposes to load and excavate at the boundary of a mapped higher-permeability deposit, in the zone of highest mapped groundwater vulnerability, without assessing the hydrogeological behaviour of that deposit.

Third, and most directly relevant to the Article 6(3) determination, the esker and gravel pocket lies on the northeast side of the site, the side that drains toward the Little Brosna River and the Sharavogue Bog SAC interface. The applicant's WFD Assessment (Appendix 9-1, S2.1) confirms that the streams in the northeast portion of the site traverse that portion before merging with the Little Brosna River at the site's northeast corner. A higher-permeability pathway in precisely this location is capable of providing the connectivity that the bedrock-only conceptual model assumes away.

3.14.3 Legal Standard and Conclusion

The applicant has mapped, within its own submission, a granular hydrogeological feature that its own cited authority (GSI, 2003b) identifies as capable of focusing flow and controlling the location of springs; has placed the heaviest construction loading of the project at its margin; and has not subjected it to any hydrogeological assessment. The feature does not appear in the source–pathway–receptor analysis. It is not addressed in the NIS connectivity assessment. The drawdown and dewatering analysis does not consider it. The conclusion of no hydrogeological connection in NIS Table 6-2 is reached without the granular pathway recorded in the applicant's own subsoil mapping ever having been characterised, modelled, or ruled out.

Under CJEU C-461/17 (*Holohan*, 2018, para.44), an Appropriate Assessment must contain complete, precise and definitive findings, free of lacunae. A mapped granular deposit, of recognised hydrogeological significance, situated at the loaded margin of the development and on the drainage side facing the SAC, left entirely unassessed, is precisely such a lacuna. The applicant has waived the Article 6(4) IROPI derogation (NIS p.4); full Article 6(3) compliance must be demonstrated on the application as submitted, and on this pathway it has not been.

Source: EIAR Ch.8 S8.3.1.3 (p.8-13); EIAR Ch.9 S9.3.3.3 (p.9-30) citing GSI (2003b); Appendix 9-1 S2.1; NIS Appendix 1 S4.1.2.3; NIS Table 6-1, Table 6-2; Hydro-G Report, Appendix 1, S1, S4.4, S8(3); CJEU C-461/17 (*Holohan*, 2018) para.44.

3.15 Ground 12 —Construction Dewatering and the Water Table

Supporting Sharavogue Bog SAC: Quantitative Assessment

Absent

This ground is independent of Ground 10. Even assuming that no hydrogeological connection exists between the wind farm site and Sharavogue Bog SAC, the assessment of construction-phase dewatering and drawdown is independently deficient: the analytical work required to dispel reasonable scientific doubt has not been carried out.

The dewatering programme is substantial; 11 turbine foundations to 4–5 m bgl, three borrow pits to 4 m bgl, a 110 kV substation and BESS, plus cut-off drains, watercourse crossings and cable trenches, against a measured peat water table of 0.4–1.5 m bgl (EIAR S9.3.3.3). Excavations will therefore operate 2.5–4.6 m below the water table, simultaneously, across a multi-season construction programme. Dewatering is acknowledged as necessary for turbine foundations and borrow pits (EIAR S9.4.4.3).

The "no significant effect" conclusion rests on two assertions: a <5 m drawdown at T8/T9 from "low permeability material" with hydraulic conductivity $<1 \times 10^{-8}$ m/s (EIAR S9.4.4.3), and a 100 m groundwater Zone of Influence applied project-wide (NIS S5.2.1.3). Neither is supported by quantitative analysis.

3.15.1 No Quantitative Dewatering or Drawdown Modelling

The submission contains no drawdown calculation, no numerical groundwater model, no pumping-test or slug-test data, no hydraulic conductivity tests on the peat, and no piezometric baseline at the receptor. The seven rounds of groundwater monitoring (EIAR S9.2.4, S9.3.3.3) record peat water table elevations on the wind farm site only; there is no monitoring point inside the SAC, the lagg, or any transect toward it.

The three rotary boreholes best placed to characterise vertical connectivity — BH02 at T9, BH03 near T4, BH04 near the central infrastructure — were drilled with water flush and backfilled on completion, each log carrying the standard "unable to determine groundwater strikes due to drilling techniques used" remark (Appendix 8-1 C). The opportunity to install nested piezometers — standard EIA practice for a peatland site adjacent to a raised bog SAC — was not taken.

CIRIA C750 (2016), cited by the applicant at EIAR S9.9, requires drawdown calculation for each open excavation, combined into a cumulative drawdown footprint, validated against site-specific permeability and storage parameters. None of that work has been done. The conclusion that the SAC is hydrologically unaffected — the single most consequential finding in the NIS for habitat 7110* — has been reached without the quantitative work the applicant's own cited guidance requires.

Source: EIAR Ch.9 S9.2.4, S9.3.3.3, S9.4.4.3, S9.9; NIS S5.2.1.3; Appendix 9-1 S2.2; Appendix 8-1 C (BH02–BH04); CIRIA C750 (2016).

3.15.2 The Five-Fold Flaw in EIAR S9.4.4.3

Section 9.4.4.3 appears to carry the entire "no significant effect on groundwater flow" conclusion. Beyond the 100 m Zol (S3.11.3 below) and the connectivity question (Ground 10), it contains five further assertions, none supported by the data on file.

1. **"Deep low permeability soils occur at T1 to T11" is contradicted by the applicant's own ground investigation.** The PSRA (Appendix 8-2) records peat at T2 (0.45 m), T3 (>2.1 m, cutover bog), T4 (4.2 m peat / 5.3 m very soft in BH03), T5 (1.2 m), T8 (3.2 m peat / 3.1 m peaty silt) and T9 (3.2 m peat / >3.7 m peaty silt / 12 m of SPT N=0 material in BH02). The BESS substation is 0.85 m peat over clay, gravel and sand (TP14/TP15/GA16). Borrow Pit C (BH04) is firm CLAY, SAND. Sand and gravel are not low permeability; peat is not low permeability — the applicant's own Peat Management Plan (Appendix 8-3, S1.2) describes acrotelm peat as "generally of high permeability." The gravel-and-esker pocket within the red-line area (Ground 7 S3.10.3) is a further direct contradiction.
2. **The " $<1 \times 10^{-8}$ m/s" value is never tested and is applied to the wrong layer.** No falling-head, rising-head, slug or pumping test result is presented anywhere in Chapter 9, Appendices 9-1, 9-2 or the Site Investigation Report (Appendix 8-1). The figure is a bare assertion. Even taken at face value for the silty clay, it does not characterise the pathway that matters — the lateral acrotelm/catotelm pathway through the peat itself. Reported hydraulic conductivity values for Irish raised bog peat span approximately five orders of magnitude (Regan et al. 2019, *Water Resources Research* 55(7): median 2.22×10^{-3} m/day across 46 piezometers at Clara Bog).
3. **">50 m to the west of the Little Brosna and Sharavogue Bog SAC" is a geometry statement, not a hydrogeological one.** The peat acrotelm does not respect a watercourse as a flow boundary. GSI subsoil mapping records the same material ("Cut over raised peat") on both banks of the Little Brosna, so the river hydrologically

links identical subsurface systems on either side rather than separating them (Hydro-G Report, Appendix 3-1, S1, S4.4).

4. **The conclusion that piling produces "no likely significant effects" ignores the design specified elsewhere in the submission.** EIAR Ch.2 S2.6.3 and Planning Drawings 11333-2042/2043 specify, per piled turbine, up to 60 × 300 mm driven concrete piles or up to 16 × 1,200–1,600 mm bored piles to ~20 m depth. Piling is anticipated at T3, T4, T8 and T9 — the four turbines on deep peat. At T9, a 20 m pile will penetrate the full 12 m of SPT N=0 material in BH02 and into the underlying gravels. CIRIA C750 treats piling through compressible soils as requiring quantitative assessment of effects on the surrounding hydraulic regime. That assessment has not been done.
5. **The "temporary decrease in water levels" is undefined and is not exempt from the Weser obligation.** Open turbine excavations typically remain dewatered for 4–8 weeks. Across 11 turbines, three borrow pits, a substation and a BESS sequenced through the CEMP construction programme, cumulative active dewatering is likely to extend 12–18 months. Under Case C-461/13 *Weser* (2015) paras 67, 69, deterioration of a quality element is prohibited even where short-lived; "temporary" is not a defence. Case C-461/17 *Holohan* (2018) para.44 requires duration and magnitude to be characterised, not asserted.

Source: EIAR Ch.9 S9.4.4.3; EIAR Ch.2 S2.6.3, S3.1.1; Planning Drawings 11333-2042/2043; PSRA App.8-2 S5; Appendix 8-1 (TP02–TP20, BH02–BH04); SPMP App.8-3 S1.2, S2.1; App.6-1 S4.2.4; CIRIA C750 (2016); Regan et al. (2019); Hydro-G Report App.1; CJEU C-461/13 (*Weser*) paras 67, 69; C-461/17 (*Holohan*) para.44.

3.15.3 The 100 m Zone of Influence Is Contradicted by the Peer-Reviewed Irish Evidence

The 100 m groundwater Zol is asserted in a single sentence at NIS S5.2.1.3 and applied to all attributes of all qualifying interests. Where dewatering and drainage effects on Irish raised bogs have been measured, impact distances are consistently well beyond 100 m.

Regan, Flynn, Gill, Naughton & Johnston (2019), *Water Resources Research* 55(7): 6153–6168, on Clara Bog (Co. Offaly, ~35 km north of Sharavogue), the directly comparable case, measured water-table drawdown at ~50 m from a marginal drain, piezometric-head drawdown reaching **150–250 m** into the high bog where peat overlies a till mound, and subsidence detectable over **900 m** from the drain. Where peat sits on more permeable substrate, drawdown

propagates substantially further than a simple permeability argument predicts. This is reinforced by

- Lensen (1991), the Irish–Dutch Raised Bog Study at Clara and Raheenmore, which recorded peripheral subsidence of ~5 cm/yr in the first 100–200 m from marginal drains;
- Lindsay (2010, IUCN UK Peatland Programme Briefing Note 3), which warns that the assumption drainage effects are confined to drain margins is one of the field's standard misconceptions, and notes that a 15 cm fall in water table can shift an entire vegetation assemblage out of its zone — directly material because the NPWS Conservation Objective for water levels at Sharavogue is set in centimetres;
- Holden (2005), *Phil. Trans. R. Soc. A* 363: 2891–2912, on lateral peat pipe-flow networks propagating signals over hundreds of metres.

None of this is engaged with anywhere in the applicant's submission. The 100 m figure is not consistent with the published Irish field data and is in any event derived from bedrock aquifer reasoning rather than from the near-surface peat water table system within which Sharavogue's lagg sits (see Ground 7 S3.10.2).

Source: NIS S5.2.1.3; Regan et al. (2019); Lensen (1991); Lindsay (2010); Holden (2005); NPWS (2015) Conservation Objectives: Sharavogue Bog SAC 000585.

3.15.4 Cumulative Dewatering Is Not Modelled

The applicant treats the <5 m drawdown at T8/T9 as if those were the only open excavations. They are not. The simultaneous open-excavation footprint includes 11 turbine foundations (4–5 m bgl), 3 borrow pits (4 m bgl, drawings 11333-2071/2072/2073), the 110 kV substation and BESS foundations, the cut-off drains flanking founded and floating road sections (App.8-3 S2.2), and watercourse crossings and cable trenches. The cumulative drawdown signature is not calculated anywhere.

Sharavogue Bog SAC will not be assessed against one turbine. It will receive the integrated hydrological signature of the entire construction programme, operating simultaneously, over multiple seasons. That signature has not been calculated.

3.15.5 The Applicant's Own Cited Guidance Requires More

Four documents cited in the applicant's own submission argue for substantially more rigorous assessment than has been carried out:

- **Kilroy et al. (2008)**, *A Framework for the Assessment of GWDTEs under the WFD*, EPA Report Series No. 12 (cited at EIAR S9.9). Raised bogs are expressly identified as GWDTEs. The framework requires identification of the supporting groundwater body, quantitative pressure assessment, and demonstration that water-level and water-chemistry needs are met. None has been done for Sharavogue.
- **NatureScot/SNH (2019, updated 2024)**, *Good Practice during Wind Farm Construction* (cited in CEMP App.2-3). Requires the EIA to demonstrate that wind farm design has taken into account site hydrology and GWDTE identification, and that hydrological connectivity be maintained. Peat depth surveys at <100 m centres are recommended; the applicant's probing density does not meet this at the interface zone.
- **CIRIA C750 (2016)** (cited at EIAR S9.9), discussed above.
- **Mackin et al. (2017)**, *Best Practice in Raised Bog Restoration in Ireland*, NPWS Irish Wildlife Manuals No. 99 (cited at App.6-1 S4.2.4). Identifies the lagg/transition zone as the critical hydrological buffer for the high bog. The applicant proposes ~5 ha of raised bog enhancement under this reference, then proposes to dewater turbine foundations and borrow pits within the same zone. Mackin et al. is selectively invoked for enhancement and ignored for impact.

Each of these is cited in support of the applicant's case. Each, read properly, undermines it.

Source: EIAR Ch.9 S9.9; CEMP App.2-3; App.6-1 S4.2.4; Kilroy et al. (2008); NatureScot/SNH (2019, 2024); CIRIA C750 (2016); Mackin et al. (2017).

3.15.6 Legal Standard and Conclusion

Ballincor is not Derrybrien — the settings are materially different — but Case C-261/18 *Commission v Ireland* (CJEU, 12 November 2019) is a reminder that EIA of wind farms on Irish peat must be carried out to the EIA Directive standard before construction, on pain of substantial penalty.

Under Article 6(3), the competent authority may grant consent only after ascertaining, beyond reasonable scientific doubt, that the project will not adversely affect site integrity (Case C-127/02 *Waddenvereniging*, 2004). Adverse effect on integrity includes any impact preventing lasting preservation of constitutive characteristics (Case C-258/11 *Sweetman*, 2013, para.43). The assessment must contain complete, precise and definitive findings free of lacunae (Case C-461/17 *Holohan*, 2018, para.44). Mitigation cannot be assumed; it must be assessed in full within the NIS itself (Case C-323/17 *People Over Wind*, 2018). Short-term deterioration is not exempted (Case C-461/13 *Weser*, 2015, paras 67, 69).

The constitutive characteristic of habitat 7110* at Sharavogue is its hydrology — specifically, the centimetre-scale water-level regime and flow-pattern attributes defined in the NPWS

Conservation Objectives. The proposed development will excavate to 4–5 m bgl at multiple locations within and adjacent to the lagg/transitional zone, dewater simultaneously across 11 turbine bases, 3 borrow pits, a substation and a BESS, and install a drainage network around an access road system that the published evidence identifies as the dominant hydrological pressure of wind farms on peat. The cumulative effect of those works on the centimetre-scale water-level regime of the SAC has not been calculated.

The certainty required by *Waddenvereniging* and *Sweetman* is not certainty in the abstract. It is certainty produced by quantitative analysis applied to the receptor in question. An Article 6(3) determination of no adverse effect on integrity, reached without quantitative drawdown modelling, without piezometric baseline data at the receptor, without cumulative dewatering analysis, without engagement with the peer-reviewed Irish raised-bog hydrology literature, and on the basis of a single load-bearing paragraph (EIAR S9.4.4.3) that fails on five separate factual grounds, does not produce that certainty. The applicant has waived Article 6(4) IROPI (NIS p.4). Full Article 6(3) compliance must be demonstrated on the application as submitted. On the dewatering and drawdown question, it is not.

Source: CJEU C-127/02 (*Waddenvereniging*, 2004); C-258/11 (*Sweetman*, 2013) para.43; C-461/17 (*Holohan*, 2018) para.44; C-323/17 (*People Over Wind*, 2018); C-461/13 (*Weser*, 2015) paras 67, 69; C-261/18 (*Commission v Ireland*, 2019); Lindsay & Bragg (2005); NPWS (2015) Conservation Objectives: Sharavogue Bog SAC 000585; CIRIA C750 (2016).

3.16 Ground 13- Maladaptation

The grounds set out across this chapter address specific technical and legal failures in the application as submitted. This closing ground steps back from that detail to identify three framing failures that go to whether the project should be authorised in this location at all. Each is a distinct legal point with its own authority. Together they answer a different question from the per-ground critiques: not "has this assessment been carried out correctly?" but "has the application demonstrated that this project, in this catchment, on this floodplain, is the right answer to the questions the consenting framework asks?"

3.16.1 A Peat-Destroying, Floodplain-Compacting Project in the Name of Climate Action

The proposed development is presented as a renewable energy project that contributes to Ireland's climate response. The application contains no analysis of whether the project, as proposed, conflicts with the State's broader climate adaptation framework — specifically, the duty under the National Adaptation Framework (NAF) and the successive National Adaptation Plans to avoid *maladaptation* in the consenting of major infrastructure.

Maladaptation is a recognised category in climate policy. It captures actions that, while ostensibly addressing climate goals, in fact increase the vulnerability of receptors, lock in unsustainable pathways, or transfer harm to other systems. The Hydro-G report raised the maladaptation question directly (Appendix 3-1, S7). The project would, on the application's own documents:

- Excavate between 59,000 m³ and 87,600 m³ of peat — a carbon sink whose destruction releases stored carbon to the atmosphere. The National Trust for Scotland (2024) factor of 172 kg CO₂eq per cubic metre, applied to the upper-bound figure on a conservative effective-destruction basis, would equate to a carbon release of the order of millions of kilograms of CO₂eq from peat destruction alone, before accounting for the ongoing oxidation of drained peat over the operational life. The application does not quantify the carbon liability of the peat destruction anywhere.

- Compact the active floodplain of the Little Brosna along the access track corridors and turbine pads (Ground 7 above), reducing the natural flood-attenuation capacity of the floodplain at exactly the moment when the climate adaptation imperative is to increase that capacity. The Mid-Range Future Scenario climate uplift adopted in the applicant's own FRA already shows T9 75% inundated and T1 40% inundated; the project then proposes to compact the floodplain through which those waters disperse.
- Disturb the priority habitat 7110 *Active Raised Bog at Sharavogue, which is itself the subject of active State-funded restoration under the AFA programme (Ground 2 above) — a programme one of whose principal climate-adaptation purposes is the re-establishment of carbon-sequestering, water-storing peatland.*
- Add construction-phase loading, drainage and dewatering pressures (Grounds 7, 11) to a waterbody at Poor status (Ground 1) where the Weser obligation prevents any further deterioration of the quality elements on which downstream ecological resilience to climate change depends.

The wind farm's operational carbon benefit, real as it is, is not the only side of the climate-adaptation balance sheet. A project that destroys a peat carbon sink, compacts a floodplain, undermines an active raised-bog restoration programme and adds pressure to a Poor-status nutrient-impaired waterbody is, on its face, in tension with the maladaptation principle. The application does not engage that tension. It does not present a comparative carbon accounting. It does not address the floodplain function loss. It does not assess its interaction with the LAWPRO-led restoration programme. And it does not characterise the operational-life carbon trajectory of the disturbed peat. An adaptation duty acknowledged in national policy but unengaged in the application cannot discharge the consenting authority's obligation to consider climate adaptation as part of its statutory function.

3.16.2 Consideration of Alternatives: "Most Suitable" Is Not "Suitable"

The EIA Directive (2014/52/EU) at Article 5(1)(d) requires the EIAR to describe *"the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the project on the environment."* Annex IV (1) requires substantive treatment of those alternatives.

As addressed in Chapter 2 previously the Applicant has not chosen Ballincor in preference to alternatives. It has simultaneously pursued all five 'alternatives' identified in its own scoping exercise. This is a portfolio strategy, not a reasoned site selection. The approach presented by the Applicant amounts to little more than a generic checklist comprised largely of developer-led considerations relating to commercial viability and technical deliverability supplemented by a broad environmental constraint filter.

The developer does not answer the substantive Annex IV question, which is whether reasonable alternatives exist that would avoid the significant adverse environmental effects identified in the grounds above arise principally from:

- The location of four turbines (T1, T2, T8, T9) within Flood Zone A/B (Ground 5);
- The location of the wind farm site immediately adjacent to Sharavogue Bog SAC, a Priority Habitat in active restoration (Grounds 10, 11);
- The location of the construction footprint within a Poor-status WFD waterbody driven by peat-disturbance and hydromorphology pressures (Grounds 1, 3);
- The deep saturated peat and SPT N=0 substrate that drives both the peat-stability and access-track risks (Grounds 6, 8).

Each of these is a *location-specific* environmental sensitivity. A "reasonable alternative" within the meaning of Annex IV is therefore not an alternative turbine layout on the same site, an alternative borrow pit configuration, or an alternative grid connection route. It is an alternative site that does not carry the relevant sensitivity. The application's Consideration of Alternatives does not present that analysis.

The decision of the Supreme Court in *Coolglass Wind Farm Limited v An Coimisiún Pleanála* [2026] IESC 5 reinforces the point in a related but distinct legal frame. The Court addressed the meaning of "*practicability*" holding at paragraphs 103–105 that "practicable" in this context means more than physically possible. Applied to Ballincor, the practicability test invites the same question as the Annex IV alternatives test: do practicable alternative locations exist that would avoid placing four turbines in Flood Zone A/B, immediately adjacent to a Priority Habitat SAC, in a Poor-status WFD catchment driven by the exact pressure categories the project will generate? The

application does not engage this question but the Inspector and the Board is invited to do so.

3.17 Conclusion

This submission has presented twelve evidence-based grounds of objection, each supported exclusively by the applicant's own submitted documents. Before summarising, the most important structural point must be restated: the applicant has expressly waived both derogation pathways. There is no flexibility and no fallback. Full compliance with Article 4(1)(a) WFD and Article 6(3) of the Habitats Directive must be demonstrated on the basis of this application as filed.

The twelve grounds address different parts of the application, but they are not isolated faults; the same four failures recur and it is the pattern that should concern the Inspector.

- The first is that the case for refusal is built entirely from the applicant's own documents; Chapter 9 calling the waterbody Moderate when its WFD classification is Poor and At Risk, the SPMP calling the peat easy to manage where nine of twelve trial pits collapsed, one NIS table finding a groundwater pathway to the SAC and the next denying it, the FRA barring road use in heavy rain while the SWMP requires staff on site in exactly those conditions.
- The second is omission at the centre rather than the margins: phosphorus, named as the main water-quality issue, was never reported; iron, visible in the applicant's own photographs, is neither baselined nor monitored; the deepest peat and highest flood risk closest to the SAC is the corridor with no ground investigation; and the one flood risk the FRA never assesses is the flood risk to the SAC.
- The third is mitigation that is deferred, undesigned, or incapable of working when needed — a "Negligible" peat rating resting on a temporary works design that does not yet exist, a track design handed to an unappointed specialist, and a pollution-control system built as though the site were dry, when it floods extensively every winter
- The fourth is assertion in place of analysis, with the conclusions that matter most resting on bare numbers and no working behind them, when certainty under EU law comes only from calculation applied to the receptor, and that calculation has not been done.

This proposed development is advanced as climate action, yet on the applicant's own documents it would excavate tens of thousands of cubic metres of carbon-storing

peat, compact an active floodplain at the very moment adaptation demands such capacity be protected, undermine a State-funded raised-bog restoration, and add construction pressure to a Poor-status catchment. This is the definition of maladaptation: environmental harm done in the name of environmental good. A development that works against the State's own climate, water and restoration commitments cannot be assessed as though its renewable output were the only entry on the ledger.

Each of these failures would give An Coimisiún Pleanála cause for concern individually. Together, they establish a position from which the pre-consent certainty required by EU law, "no reasonable scientific doubt that the project will not adversely affect the integrity of the downstream European sites", cannot be reached on the basis of this application as submitted. Further, it is important to briefly revisit the *Coolglass* judgment. The previous chapter engages the deeper argument; the aspect more relevant here is the Supreme Court's treatment of "in so far as is practicable." At paragraphs 103–105 the Court held "...that there may be circumstances in which the relevant body may *not be required* to perform its functions in a manner consistent with the s.15 objectives *where it is not practicable to do so*" ... "*practicable... means capable of being carried into action... having regard to such practical difficulties as exist.*"

In essence, even where a site is designated as appropriate, **Ballincor is not**, there are cases where it is not practicable to grant permission consistent with s.15 obligations. A development in Flood Zone A/B is inherently constrained in a way that limits what is practicable. A development in Flood Zone A/B, buffered from a Priority Habitat SAC only by a hydrological corridor that links onward to an SPA and a wider regional network of SACs, is doubly so. This site is neither designated nor practicable. On the hydrological and hydrogeological evidence, all of it the applicant's own, consent cannot lawfully be granted.

APPENDIX 5: Landscape and Visual Impact

Chapter 8 Landscape and Visual Impact Assessment

Appendix 8-1:	Receptor Assessment Software and Method
Appendix 8-2:	Ballincor Coordinates with Elevation
Appendix 8-3:	Review of Applicants Photomontage Each VP
Appendix 8-4:	Dataset by Receptor

8.0 Introduction

This report presents an independent assessment of the landscape and visual effects of the proposed Ballincor Wind Farm. It responds to, and should be read alongside, Chapter 12 of the applicant's Environmental Impact Assessment Report, Appendix 12-1, Appendix 12-2 and the LVIA Photomontages. The Applicant concludes that an eleven-turbine development of 180-metre structures, with 312 dwellings within 3 kilometres, will produce no significant landscape, visual or cumulative effect at any location.

This report tests that conclusion against the facts of the receiving landscape, against the statutory and professional standards the applicant's assessment claims to follow and against the evidence of an independent receptor-level analysis that the applicant's assessment does not contain. The community group licensed Windplanner software (Appendix 8-1) for this purpose, so that the Commission would not be reliant solely on the applicant's own visual material. The imagery, mapping and receptor data generated by Windplanner are used throughout and a complete analysis is presented in Appendix 8-4: Dataset by Receptor.

The chapter is presented in three parts:

Part A — The Project in this Landscape presents the context the assessment must answer to: the statutory designations that exclude this site from wind energy development; the adopted landscape sensitivity classification; the settled, inhabited character of the receiving landscape; the topography that places the surrounding population at or above the level of the development; the distance and elevation geography of the 312 surrounding dwellings; the existing and permitted wind energy already committed to the same visual envelope; and the methodology standards — WEDG 2006, GLVIA3 and LITGN-2024-01 — against which any competent assessment falls to be measured.

Part B — The Applicant's Approach reviews Chapter 12 of the EIAR against that context and those standards: its classification of the landscape and its sensitivity; its treatment of the Development Plan designations; its Viewpoint selection; the sensitivity, magnitude, quality and duration judgements from which its findings are built; and its cumulative assessment. The critique is not that the applicant adopted the wrong framework but that it did so selectively. At each point where the stated framework met the facts of this site the assessment departed from its own principles and every departure operated in the same downward direction.

Part C — Receptor-Level Analysis presents the assessment the applicant did not carry out: a dwelling-by-dwelling analysis of all 312 receptors, grouped into 21 clusters, with turbine visibility, distance, elevation and cumulative exposure recorded for each, based on photomontages and viewshed data generated using WindPlanner licensed software in February 2026. See Appendix 8-4 for detailed analysis.

Each Part presents its issues in turn and closes with a summary of findings. The report's central submission can be stated at the outset - the applicant's conclusion of "Not Significant" is not a finding the evidence produces, it is the product of the choices made by the Applicant to reach it. A properly conducted assessment of this site using the actual landscape character assessment, from the locations where its population actually lives, produces a materially different conclusion.

We present to the Commission five principal failures in the Applicant's Landscape and Visual Impact Assessment, each giving rise to a number of discrete Grounds of Objection.

Principal Failure 1 — The assessment is built on a misstatement of the adopted statutory landscape designation

The applicant's LVIA states that the site lies within "Moderate and Low" landscape sensitivity. The adopted Offaly County Landscape Character Assessment classifies it as **High/Moderate (Red/Orange)** sensitivity, one of very few areas in the county outside the Slieve Blooms to attract that classification. This is not a contestable matter of professional judgement; it is a verifiable matter of public record. Because sensitivity is the foundational input to the applicant's own significance methodology, every sensitivity rating and therefore every significance finding in Chapter 12 is built on a baseline that misdescribes the adopted statutory position. The consequence extends beyond the individual ratings: An assessment shown to have misstated a verifiable fact at its foundation cannot expect the deference its professional judgement would otherwise command on those matters that are less readily checked.

- **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.
- **Ground 2** — That misclassification 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.

- **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.
- **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.

Principal Failure 2 — The receiving environment is materially mischaracterised, suppressing sensitivity and magnitude

The chapter characterises the landscape as a "robust" peatland-fringe landscape that is "quite flat" with "gentle undulations." Both descriptions are materially incomplete in ways that operate to suppress assessed effect. The landscape is in fact a settled, inhabited agricultural landscape of 312 dwellings within approximately 3 km, with five population centres within approximately 5 km — and residents are, on GLVIA3's own terms, among the most susceptible of all visual receptors. The terrain is not flat in the sense that matters: the site occupies a topographical bowl, and the surrounding receptors view it from level or elevated ground, increasing exposure rather than diminishing it. The receiving landscape is not capable of absorbing a development of this size, scale and layout.

- **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.
- **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.
- **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.
- **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.

Principal Failure 3 — Viewpoint selection and omission suppress the visual effect the assessment was required to find

The benign result the LVIA reports is not a property of the development but of how the development was looked at. The viewpoint set is weighted towards distance, obstruction and

visually favourable conditions. The most exposed parts of the receiving environment are not assessed at all. The median viewpoint sits at 7.3 km against a receptor population whose median distance is 1.7 km; the worst-case-view requirement of WEDG 2006 is not met; and the densest receptor clusters, the principal settlements and the night-time environment have no effective representation.

- **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).
- **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.
- **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.
- **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.
- **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.
- **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.
- **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.

Principal Failure 4 — Significance is suppressed at every controllable input, and "Not Significant" is the product

Even where the chapter assesses, it suppresses significance through a series of internal choices each of which fails on the chapter's own stated criteria. The sensitivity input is the principal one: the assignment of "Medium-low" sensitivity to near-field residential receptors

cannot be derived from the chapter's own criteria and correcting that single input carries multiple viewpoints across the applicant's own significance threshold. The proposed development is visually dominant, overbearing and incongruous with its receiving environment.

- **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.
- **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.
- **Ground 18** — "Neutral" landscape-quality findings contradict the chapter's own default characterisation of the receiving landscape.
- **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.
- **Ground 20** — The chapter concedes the long duration of the effect and then fails to carry that concession into its significance conclusions.
- **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.

Principal Failure 5 — The cumulative assessment never reaches the receptors

Section 12.7 disposes of cumulative effect in summary terms. It does not assess the cumulative effect at the dwellings that experience it, dismisses the cumulative ZTV without evidence, and fails the WEDG cumulative test for the very landscape type the chapter claims. The receptors live within and around a triangle of three developments — Ballincor (11), Lacka/Knockshigowna (8) and Carrig (7), twenty-six turbines — and experience them not as alternatives but as accumulation from multiple directions.

- **Ground 22** — The cumulative assessment is conducted at landscape level and never reaches the individual receptors, where the cumulative effect is actually experienced.
- **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 development to be assessed together.

- **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 unevidenced.
- **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.
- **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.

Overall Conclusion on the Grounds

Each Principal Failure above is independently sufficient to discredit and invalidate the LVIA's conclusion of "Not Significant". Taken together they establish that the conclusion is not the product of objective visual analysis but of a chain of choices — misclassification at the foundation, mischaracterisation of the receiving environment, viewpoint selection and omission, significance suppression at every controllable input, and a cumulative assessment that never reaches the people affected — every link operating in the same direction. When the applicant's own significance matrix is applied to the full population of 312 dwellings the applicant chose not to assess, corrected only for inputs demonstrably wrong on the public record, the finding of "no significant effects" does not survive: **88% of dwellings experience a significant effect from the proposed development alone, and 92% cumulatively**. The Commission is respectfully invited to find that the proposed development would give rise to significant adverse residential visual effects, that it would materially contravene the landscape and visual protection objectives of both County Development Plans, and to refuse permission accordingly.

Part A - CONTEXT: THE PROJECT IN THIS LANDSCAPE

8.1 The Project and its Setting

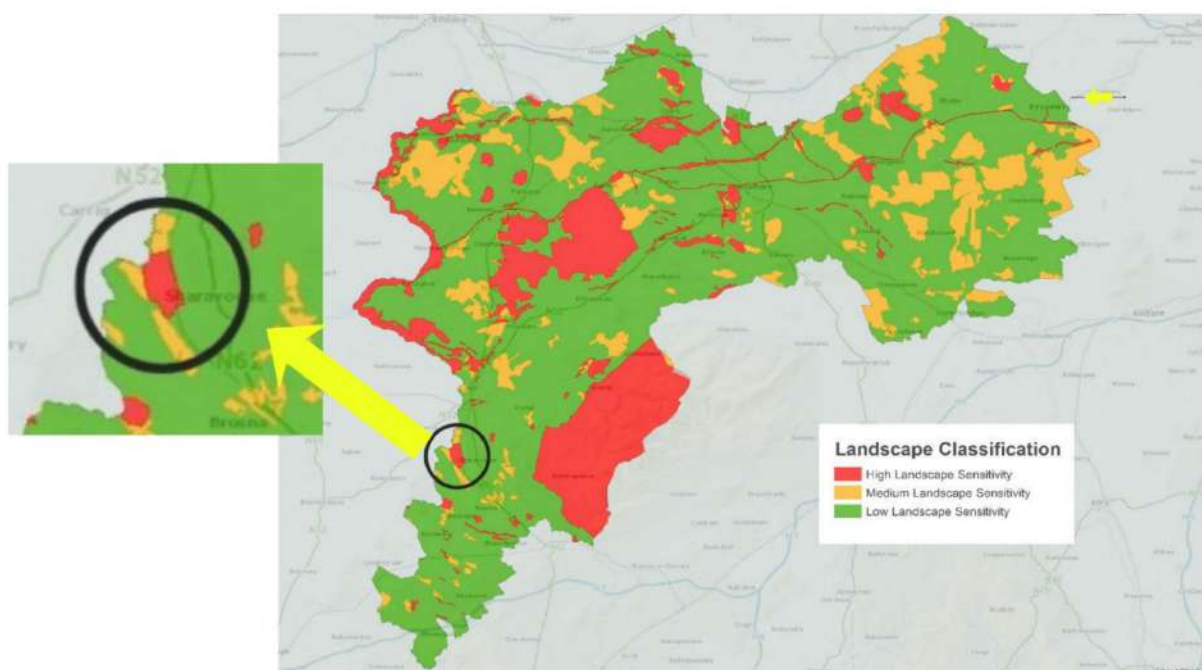
The proposed Ballincor Wind Farm comprises eleven wind turbines of 179.5 to 180 metres blade-tip height, located in the townland of Ballincor, Co. Offaly, on the boundary with Co. Tipperary. Nine of the eleven turbines are sited within County Offaly; the two northernmost turbines lie just within County Tipperary. The application further includes a permanent 104-metre lattice meteorological mast in proximity to Turbine 10, a battery energy storage system (BESS) compound, and a substation. The applicant has applied a stated minimum setback of 720 metres (four times tip height) from the curtilage of sensitive property receptors, with the exception of an involved landowner.

A single fact of statutory planning policy frames everything that follows in this chapter. The site lies within an area designated "Not Deemed Suitable for Wind Energy Developments" under the Offaly County Development Plan 2021–2027 (Wind Energy Strategy, Map No. 10), a designation the Plan attributes to "significant environmental, heritage and landscape constraints and housing density." This designation is further endorsed by the Tipperary County Development Plan 2022–2028 where that portion of the site also lies within an area also classified as "Unsuitable for New Wind Energy Development".

The weight properly attaching to these designations has been addressed comprehensively in Chapter 2 of this submission, and it is not proposed to repeat that analysis here; suffice to say the Offaly Wind Energy Strategy is not, as the applicant has elsewhere contended, an outdated or broad-brush instrument: it is a current, statutory, evidence-based component of a Development Plan adopted in 2021 and operative to 2027, produced through the sieve-mapping methodology recommended by the EMRA Regional Spatial and Economic Strategy, subjected to Strategic Environmental Assessment and Appropriate Assessment, adopted by the elected members following public consultation, and reviewed by the Office of the Planning Regulator without adverse intervention. The Supreme Court in *Coolglass* [2026] IESC 5 confirmed the CDP is a relevant and legitimate consideration for the Commission, in a judgment which also affirmed that a designation of this kind is an expression of proper planning and sustainable development, not an obstacle to it, that section 37(2)(b) of the Planning and Development Act 2000 permits a grant in material contravention only in

exceptional circumstances not present here; and that the Commission has itself consistently refused wind energy applications within CDP exclusion zones. For the purposes of this chapter, the consequence is straightforward: the landscape and visual assessment that follows is conducted against a statutory designation of unsuitability that remains current, evidentially grounded and undisturbed — and any assessment, including the applicant's, must engage with that designation rather than argue around it.

Within that context the adopted Offaly County Landscape Sensitivity mapping classifies the Ballincor area as **High/Moderate Sensitivity (Red/Orange)** — one of very few areas in the county outside the Slieve Blooms to attract that classification, a rarity which heightens rather than diminishes its protective importance. That classification extends beyond the county boundary line into the Tipperary Development Plan to complete the classification of the windfarm development site.



Fig

Figure 8-1: Image from the adopted Offaly County Landscape Sensitivity map

Chapter 12 of the EIAR asserts the contrary: that “the proposed wind farm lies within the Moderate and Low Sensitivity classifications.” This is not a difference of professional opinion, nor a marginal question of where a classification boundary falls relative to the site edge: the site sits squarely within an area shaded High/Moderate Sensitivity, and no reading of the adopted mapping supports the applicant's statement.

There is no argument here although perhaps the Applicant suggests that the ‘plot of landscape’ is not shaded in red but neither is it shaded in green. Further, landscape is not

limited to a plot of land, it captures the vista, the views, the aesthetic of an area, precisely the purpose of a Landscape and Visual Impact Assessment.

The consequence is twofold. First, sensitivity is the foundational input to the applicant's own significance methodology — every sensitivity rating and therefore every significance finding in Chapter 12, is built on a baseline that misdescribes the adopted statutory position. Second, and more fundamentally, an assessment shown to have misstated a verifiable matter of public record at its foundation cannot ask the Commission to rely on its professional judgement in matters that are not so easily checked. The discrepancy and its full consequences for the applicant's ratings are addressed later.

The receiving landscape is a settled, inhabited, agricultural landscape. There are 312 residential dwellings within approximately 3 kilometres of the proposed turbines.

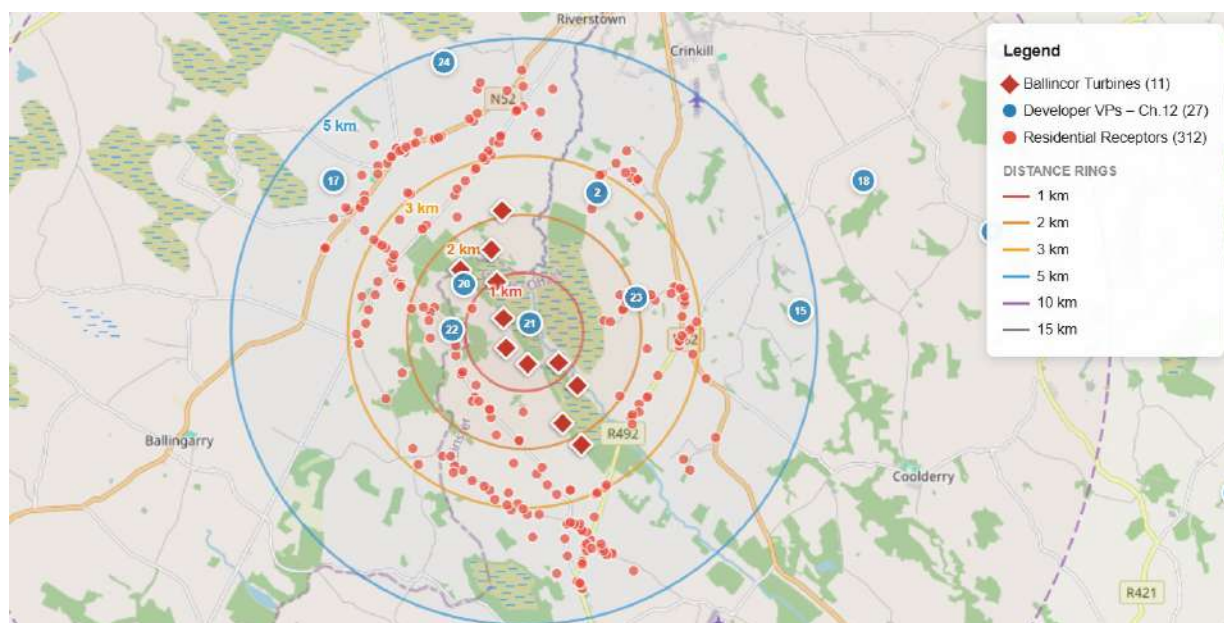


Figure 8-2: Map of Development Site and location of 312 Receptors by distance

The towns and villages of Birr (population approximately 5,000), Carrig, Riverstown, Crinkill and Shinrone all lie within 5 kilometres of the site. This is not remote cutaway bog. The density and distribution of dwellings, and the proximity of substantial population centres, are matters of objective, mappable fact.

8.2 Drone Imagery — What this Landscape Actually Is

So that the Commission would **not** be reliant solely on the applicant's own visual material, the community group licensed Windplanner software (Appendix 8-1) an established specialist visualisation platform used internationally for wind and solar farm assessments. Its outputs are based on georeferenced, three-dimensional modelling against surveyed photographic baselines, allowing turbine scale, location, screening and partial visibility to be tested from selected viewpoints with the highest degree of visual accuracy.

An independent body of drone imagery, photomontages and mapping for the receiving environment was produced. This section presents drone imagery captured from publicly accessible locations within 5 kilometres of the proposed site, recording the landscape from each cardinal direction. In every image the drone is hovering at an altitude well below the 180-metre tip height of the proposed turbines. The imagery serves five purposes, each addressed in turn below:

- it records the present character of the landscape;
- it demonstrates the spatial extent of the proposed array;
- it illustrates the topographic relationship between the site and its surroundings
- it presents the larger population clusters and their relationship with the development site
- it demonstrates the absence of effective screening between the proposed turbines and the surrounding receptors.

The reason drone imagery matters in this assessment is methodological. A ground-level photomontage, taken from a single point chosen by the applicant, shows one view. Aerial imagery at sub-tip-height altitude shows the relationship between the development and the entire receiving environment simultaneously — the dwellings, the roads, the settlements and the terrain — in a way no selected viewpoint can conceal or flatter. Imagery of this kind allows the Commission to test the applicant's characterisation of the landscape against the observable reality.

8.2.1 Landscape Character

Chapter 12 of the EIAR characterises the receiving environment as a "robust" productive rural landscape of peatland and peatland-fringe farmland, and on that characterisation builds its case that the landscape can absorb eleven 180-metre structures. The drone imagery demonstrates that this characterisation is materially incomplete. What the images record is a settled agricultural landscape with houses and farmsteads visible in every direction from the site boundary — a landscape of working farms, family homes, local roads, a church, a national

school and GAA grounds, with the town of Birr on its northern horizon, the village of Shinrone at its southern tip and the villages of Carrig and Riverstown in close proximity.

The significance for the assessment is direct: under GLVIA3, the sensitivity of visual receptors is a function of the people who experience views, and residents at home are expressly identified as among the most susceptible receptor groups. A characterisation of the landscape that minimises its inhabited character feeds directly into suppressed sensitivity ratings as will be examined later.



Figure 8-3: Drone view EAST to the proposed site There is no intervening terrain or vegetation of sufficient height to provide screening at 180 m tip height.



Figure 8-4: Drone view WEST to the proposed site There is no intervening terrain or vegetation of sufficient height to provide screening at 180 m tip height.



Figure 8-5: Drone view Carrig NORTH to the proposed site There is no intervening terrain or vegetation of sufficient height to provide screening at 180 m tip height



Figure 8-6: Drone view Shinrone SOUTH West to the proposed site



Figure 8-7: Drone view at 45 m height near Birr. The eleven proposed turbines are clearly visible from this northern approach to the site. No screening of significance between the town and the turbines.



Figure 8-8: Drone view at 100 m height taken at Birr Airfield. The view demonstrates the visibility of the proposed array from the northern side of the site, immediately adjacent to the town of Birr. Birr (population approximately 5,000) does not appear as a Centre of Population assessment within the developer's LVIA, despite lying within 4 to 5 kilometres of the site.

8.2.2 Spatial Extent, Layout and Visual Presence

The drone imagery reveals a feature of the chosen design that warrants particular emphasis: the eleven turbines are arranged in a long, broadly north–south linear "string" rather than in a clustered or grouped configuration. From every drone vantage point, the array reads as a single continuous line occupying the lateral extent of the visible horizon.

This matters because a clustered turbine arrangement concentrates visual impact within a narrower angular extent of view; receptors positioned to one side or the other retain a partially clear horizon. The linear arrangement chosen here removes that possibility: there is no direction from which a clear horizon is preserved. The layout maximises the number of turbines that can be accommodated and in doing so, it maximises the horizontal spread of visual impact across the surrounding receptors. The Wind Energy Development Guidelines 2006, in their cumulative guidance for the very landscape character type the applicant claims for this site (Flat Peatland), warn that turbines should *not* be perceived to "crowd and dominate" the flat landscape. The chosen layout is the maximal form of crowding this site can accommodate. This point is developed later.

8.2.3 The Scale of the Proposed Turbines

The scale of wind energy development in this part of Co. Offaly has changed markedly over twenty-five years. The Lacka / Skehanagh turbines near Knockshigowna Hill, built around 2002–03, have a rotor diameter of 52 m, a hub height of approximately 50 m and a tip height of approximately 80 m. The proposed Ballincor turbines have a rotor diameter of up to 63 m, a hub height of up to 105 m and a tip height of approximately 180 m — more than twice the tip height of the operational turbines already in this landscape.

Table 8-1: Scale and Size of Modern Turbines

#	Development name	Timeframe it was developed	Hub Height	Blade Diameter	Base to blade tip height	% increase in size from Lacka/Skehanagh
1	Lacka/Skehanagh	2000's	+~50m	52m	+~80m	
2	Mountlucas	2010's	+~100m	101m	+~142m	177%
3	Ballincor (proposed)	2026	+~105m	160m	+~180m	225%

Table 1

To place 180 m in context: it is roughly twenty times the ridge height of the two-storey dwellings that predominate locally (approximately 9 m), and some 60 m taller than the Spire in Dublin (120 m). The turbines would stand in a rural agricultural landscape immediately adjacent to the Sharavogue Bog, a designated Strategic Conservation Area. This scale relationship — examined receptor by receptor in Part C — is the starting point for the assessment of magnitude.

Figure 8-9 below illustrates this.

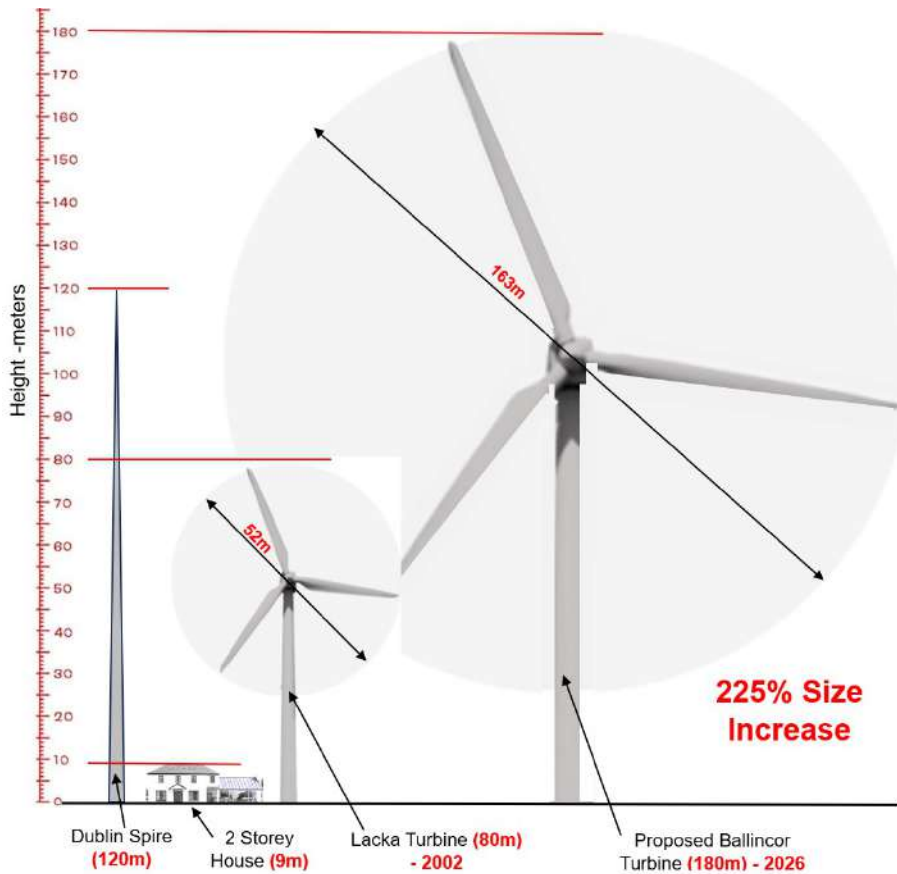


Figure 8-9: Exponential size increase in wind turbines in Co. Offaly over 25 years

The 20-1 scale ratio is clearly visible in the Photomontage images below.



Figure 8-10: Photomontage Receptor 101 – Ground View



Figure 8-11: *Photomontage – SV19 – off Clonkelly Lane Ground View– Scale of turbines in relation to homes*



Figure 8-12: *Photomontage –SV1 Ground View Scale of overbearing wind turbines from the L1071 road*



Figure 8-13: *Photomontage - SV11B Ground View – Gortavally Road- turbines close to 3 homes*



Figure 8-14: Photomontage- SV16- Off R492 Carrig Village Ground View - a home with the proposed turbines in the background

8.2.4 Topography, Elevation and the Visibility of the Development

Chapter 12 describes the receiving landscape as "quite flat" with "gentle undulations." This is a misleading description. The Ballincor site itself occupies a low-lying position but within a topographical bowl — in a valley landscape drained by the Little Brosna river watercourses, which occupy the lowest ground. Within an 8 km radius of the site centre, ground levels range from approximately 46 m to 158 m AOD. The terrain rises to the east towards Kilcolman Hill, to the west towards the Loughkeen / Carrig ridge, to the south towards the Shinrone uplands and to the north towards Birr. The larger population centres of Birr and Carrig overlook the site from elevated ground. A receptor analysis based on the Applicants elevation data proves the point; 301 of 312 dwellings sit at or above turbine-base elevation, and 161 sit above the lowest point of the rotor sweep,

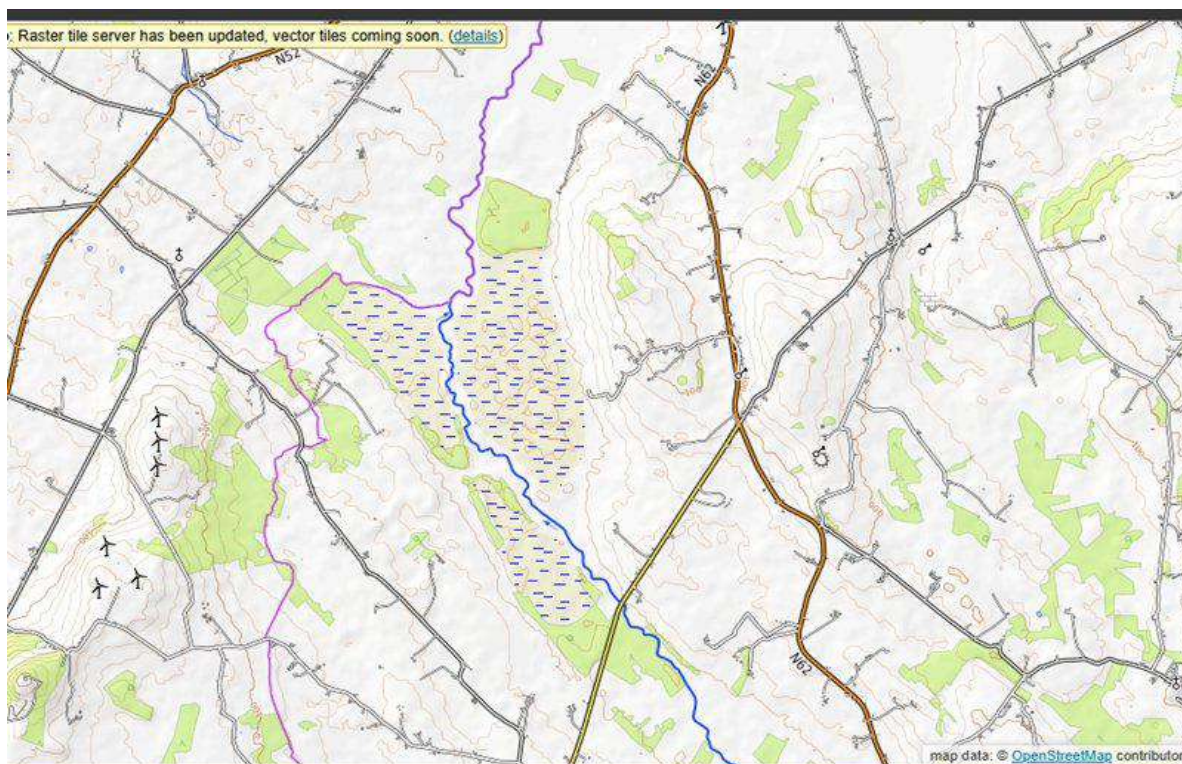


Figure 8-15: Topographic context. The hatched zone shows the area within which the eleven turbines are arranged. Contours show the site occupying a depression, with ground rising to the east and west in particular.

Two cross-sections make the point. North to south, from Birr through the site to Shinrone (c.16 km), levels vary only between approximately 46 m and 87 m, and between Birr and the site centre by about 10 m across some 8 km — substantially flat ground following the valley of the Little Brosna. East to west through Turbine 6 (c.16 km), levels vary between approximately 46 m and 158 m. The combined effect is that dwellings on the valley sides, such as those at Rathbeg Lane, look across and along the valley and can see most of the proposed turbines ranged along its floor, over the intervening hedgerows and trees.

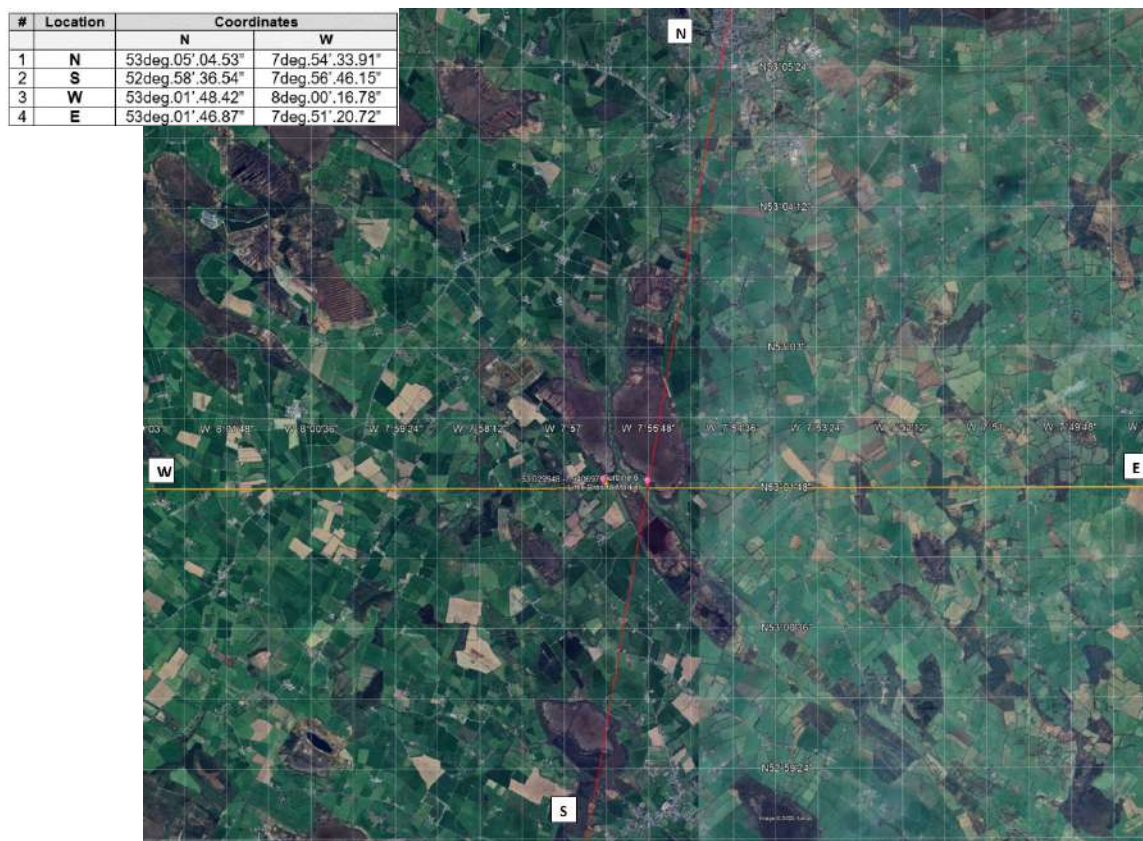


Figure 8-16: Cross section locations

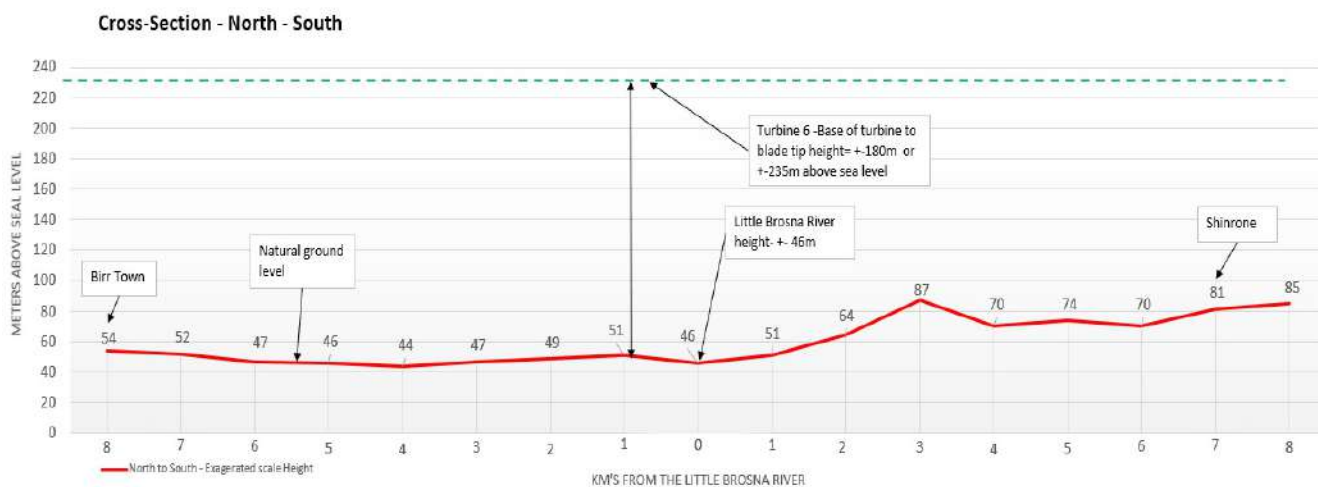


Figure 8-17: Cross section - North to South

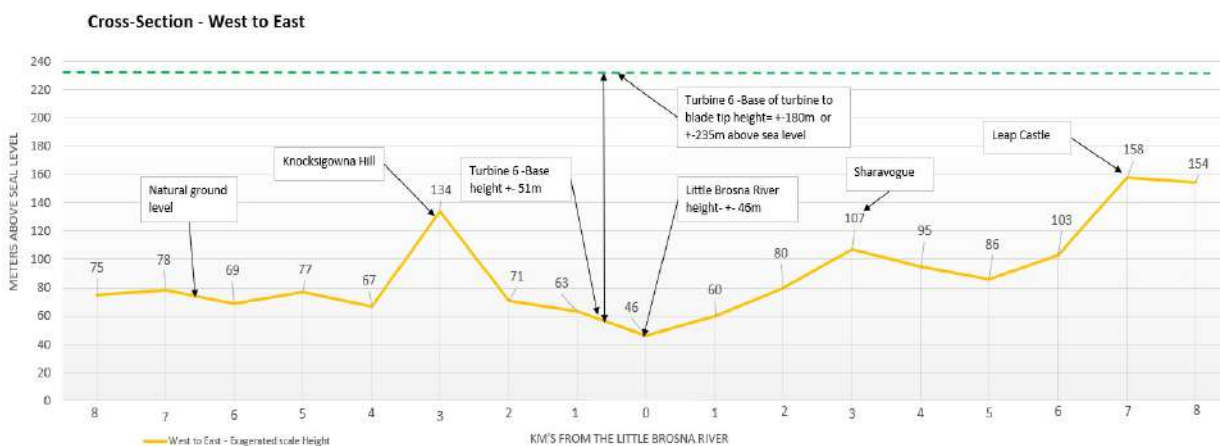
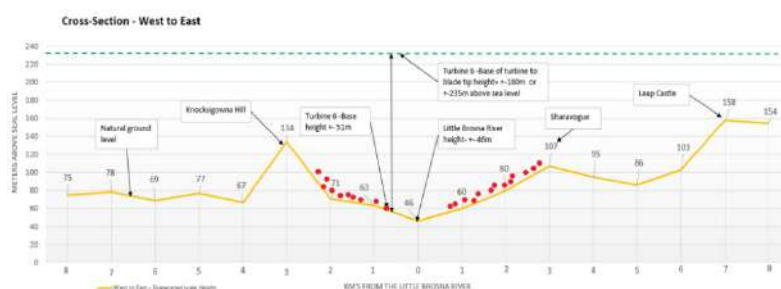


Figure 8-18: Cross section -West to East - Cross-section with Receptor nodes in red BELOW

The majority of the 312 receptors live on the Eastern and Western flanks of the valley and sit at elevation, in some cases significant elevation, above both the turbine base and the lowest point of the rotor sweep.

This topographic configuration matters because **elevated receptors see more, not less** and the data available in Appendix 8-2 is revealing, a summary is presented below.

Table 8-2: Receptor Elevation relative to Turbine Base and Rotor Sweep

Receptor elevation relative to the development	Elevation band (m OD)	Number of receptors	% of total
Below mean turbine base elevation	< 48.85	11	3.5%
Between mean turbine base and lowest blade sweep	48.85 – 65.85	140	44.9%
Above the lowest point of the rotor sweep	≥ 65.85	161	51.6%
TOTAL		312	100.0%

- The eleven proposed turbines are sited on the floor of the valley: their bases lie between 42.5 and 62.4m OD (median 48.3m OD)
- 301 of the 312 receptors (96.5%) sit above the base elevation of their nearest turbine. Every dwelling but eleven look down onto, or level with, the foot of the turbine nearest to it.
- The lowest point of the rotor sweep, sitting some 17m above each turbine base (between 59.5 and 79.4m OD across the eleven turbines, median 65.3m OD). Above that level a receptor sees not just the towers but the full plane of the moving rotor presented against open sky, rather than absorbed against a terrain backdrop. On an

eye-level basis (taken at +2m above ground), 161 of the 312 receptors (51.6%) have a sightline above the blade bottom of their nearest turbine.

- Of these, 118 sit 10m or more above the blade bottom, 56 sit 20m or more above it, and 31 sit 30m or more above it; the highest receptor stands 61.8m above the blade-bottom level. A clear majority of the surrounding community therefore looks directly into the rotor plane of the development.

This pattern provides useful context for understanding how distance and screening can influence the level of visual impact in an area surrounding a site.

- Distance: The weakening of visual effect with distance operates most strongly where a receptor looks up at a turbine from below, against a backing of higher ground, and most weakly where the receptor looks down or across into the development, against open sky. A receptor at or above turbine base elevation has a longer, less obstructed sightline; a greater proportion of each structure, tower as well as rotor, remains in continuous view; and the turbines read against the skyline rather than being absorbed against a terrain backdrop.
- Screening: No intervening landform exists to screen turbines occupying the lowest ground, and the elevated position of the receptors sustains the exposure. This prevails almost universally.

The Photomontage image below captures that effect.



Figure 8-19: Photomontage-SV4A Ground View - houses on elevated slopes of Rathbeg Lane with turbines in the valley



Figure 8-20: Photomontage -GroundView Residential area –Wood Lane Close- Birr Heritage Town

8.2.5 Population Centres

The two largest settlements are the most exposed, precisely because they sit at elevations at or above the turbine base elevations but the ground between them and the site is broadly flat.

Table 8-3: Population of the main settlement areas (2022 CSO Census)

#	Settlement	Population (2022)	Designation
1	Birr	4,726	Heritage Town / ACA
2	Crinkill	795	—
3	Shinrone	707	—
4	Carrig	226	—
	Total	6,454	



Figure 8-21: *Photomontage -D3- Birr Heritage Town with Church, Castle & turbines in the distance at 150m height*



Figure 8-22: *Photomontage -VP7- Residential area –Wood Lane Close- Birr Heritage Town*



Figure 8-23: *Photomontage D6 -Residential area above School Street-Birr Heritage Town from 150m height*

Birr is a highly sensitive visual and heritage receptor, not simply a nearby town. It is formally recognised as a Georgian Heritage Town, valued for its intact 18th- and 19th-century planned streets, squares, terraces and historic townscape, and is further protected through Architectural Conservation Area and Protected Structure designations. The absence of meaningful viewpoints from Birr's residential areas, elevated approaches and historic urban setting is therefore a material gap in the LVIA, particularly given Birr's role as both a major population centre and a protected heritage town within the study area.

8.2.6 Absence of Effective Screening

Effective screening of a wind energy development depends on intervening terrain or vegetation interrupting the sightline between receptor and turbine. Where, as here, the turbines occupy the

lowest ground and the receptors occupy the rising ground around them, intervening terrain by definition does not exist, a bowl cannot be screened.

The drone imagery demonstrates this directly. In each image the drone hovers well below tip height, yet the position of all eleven turbines is exposed to view, with no intervening landform or vegetation of sufficient height to interrupt the sightline. Hedgerows and treelines in this landscape typically reach 10-20 metres; mature commercial forestry perhaps 25-30 metres. A 180-metre turbine with a rotor sweep whose lowest point remains far above any vegetation in the landscape cannot be screened by any of it except at very close range where a tree immediately adjacent to a dwelling may intercept a narrow arc of view. Screening of that kind is incidental, partial, seasonal (deciduous cover is absent for roughly five months of the year) and outside the control of either the applicant or the receptor. It is not mitigation; and the absence of winter photomontages from the applicant's assessment means that even this incidental screening has been presented at its seasonal maximum.

The Applicants ZTV maps below corroborate this position. The blue area illustrates those areas that have a potential view of 9-11 turbines in the 20km study area

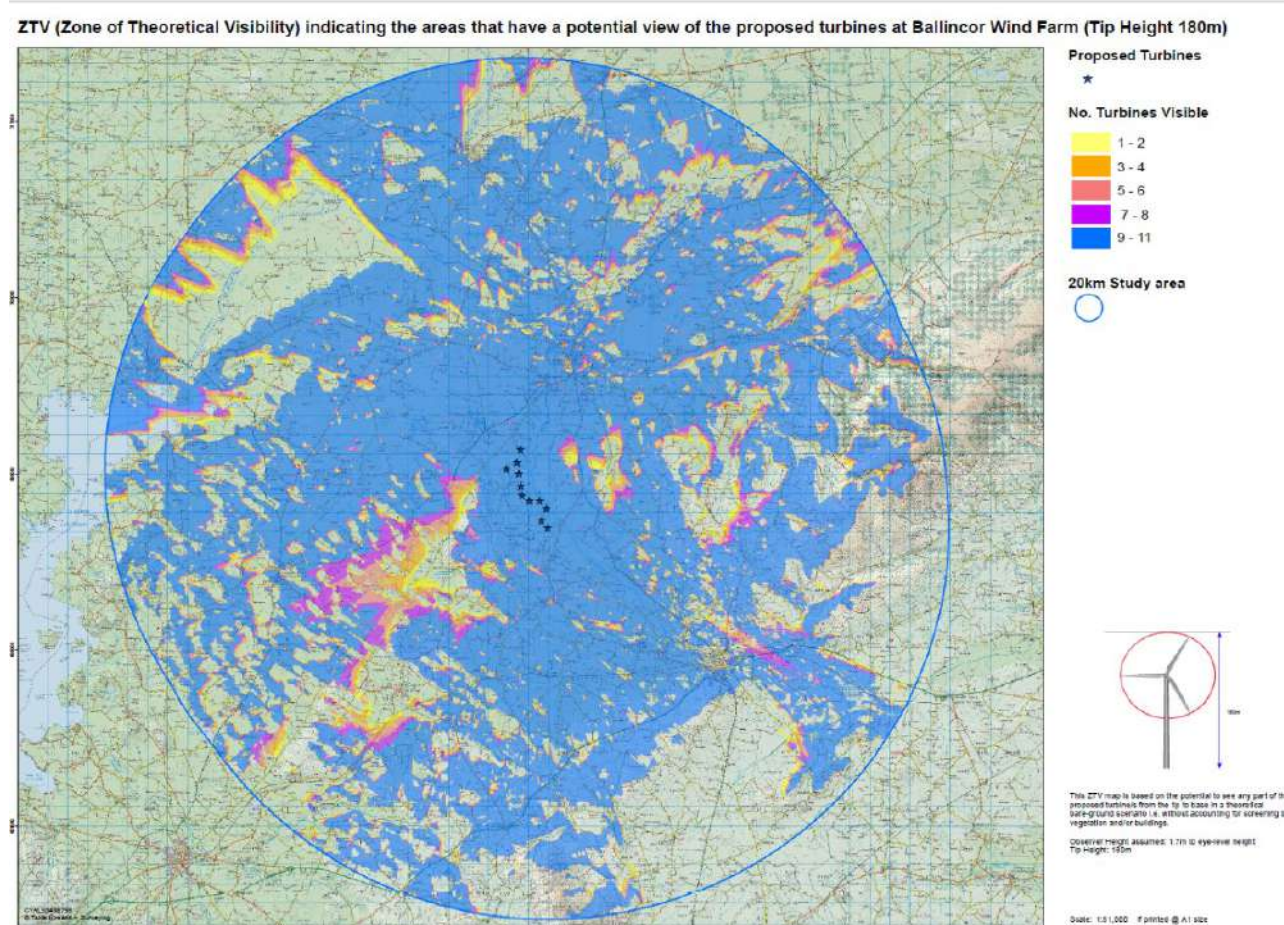


Figure 8-24: ZTV Map View of 9-11 Turbines

A zoomed in analysis below shows the potential view of 9-11 turbines with approximately 7km of the development site. Full exposure is the reality for almost all within this zone.

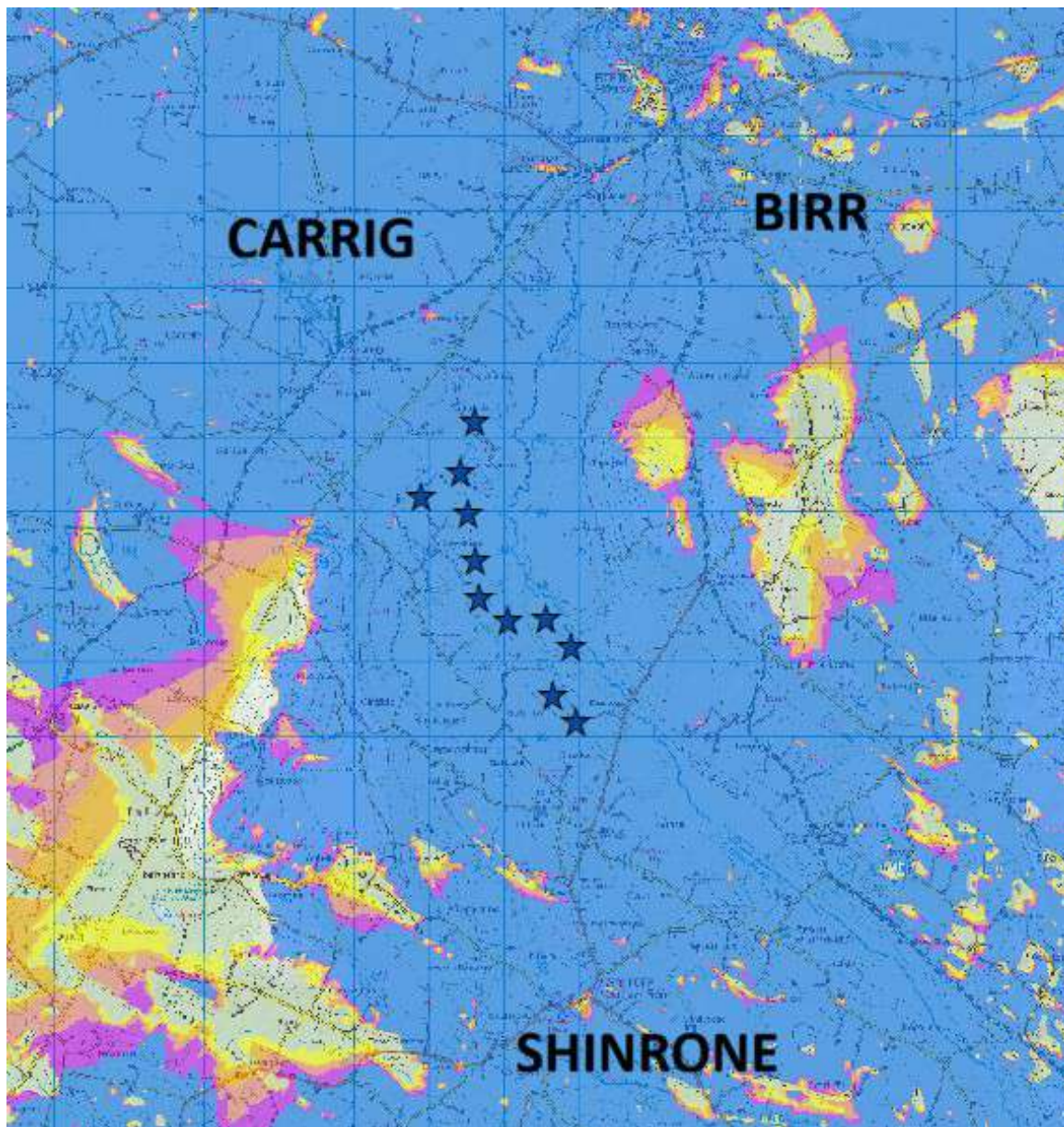


Figure 8-25: *Zoomed in View*

Part C of this report will review the ZTVs from the individual receptor perspective, a study not conducted by the Applicant.

8.3 Receptor Analysis

The fundamental question in any visual impact assessment is: who will actually experience the change, from where, and at what distance? This section answers that question with mapped, measurable data for the full population of residential receptors surrounding the site — the analysis the applicant's LVIA does not contain.

8.3.1 Distance from Turbines

A total of 312 residential dwellings have been identified and mapped within the near study area surrounding the proposed development.

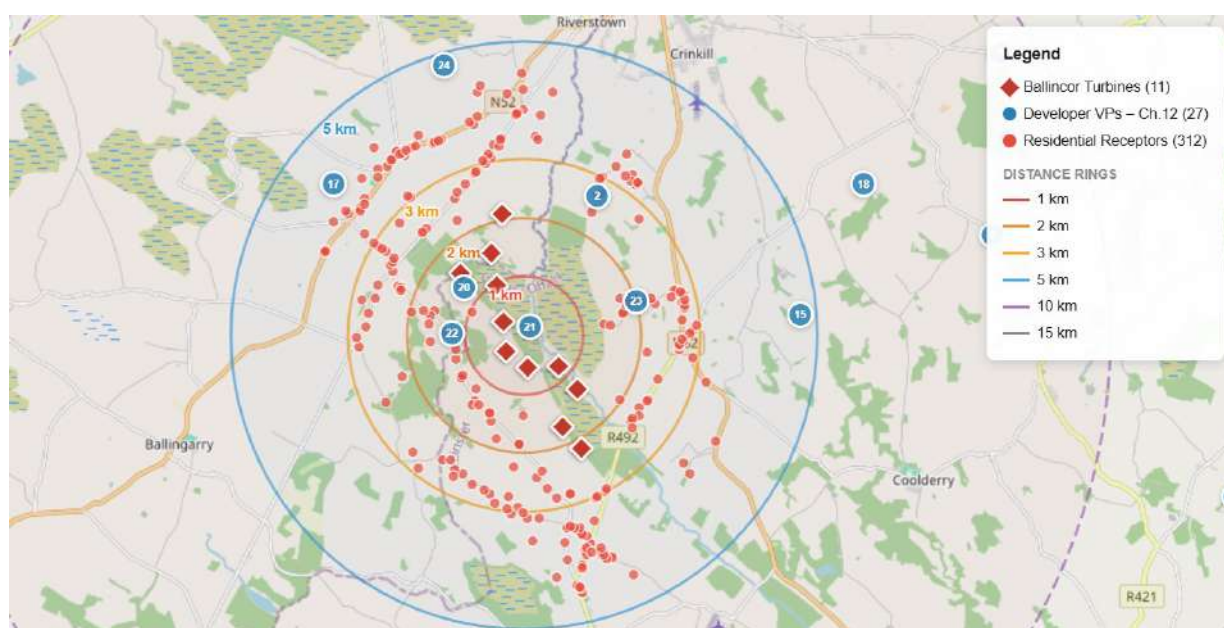


Figure 8-25: Map of all 312 Receptors

Distances from each dwelling to the nearest proposed turbine were calculated from coordinates for every receptor and are presented below.

Table 8-4:

Distance band to nearest Ballincor turbine	Number of receptors	% of total
Less than 1 km	50	16.0%
1 to 2 km	166	53.2%
2 to 3 km	96	30.8%
3 to 5 km	0	0.0%
Greater than 5 km	0	0.0%
TOTAL	312	100.0%

All 312 identified receptors fall within 3 km of the nearest proposed turbine. Two hundred and sixteen receptors (69%) lie within 2 km. Fifty receptors (16%) lie within 1 km. The median distance from receptor to nearest turbine is 1.72 km.

This matters because distance is the single most powerful variable in visual impact. Magnitude of visual change weakens or lessens with distance; the applicant's own methodology acknowledges as much, and its significance findings at distant viewpoints depend upon it. It follows that the distances at which an assessment chooses to assess are determinative of what it finds. The relevant distances are by GLVIA and WEDG 2006 guidelines **not** those convenient to the assessor: they are the distances at which the affected population actually lives. In this case the median resident of this landscape experiences the proposed development from approximately 1.7 km. As will be discussed later the median viewpoint in the applicant's assessment sits at 7.3 km — more than four times further away.

8.3.2 Elevation of Receptors Relative to Turbines

For the reasons set out previously receptor elevation relative to turbine base elevation is a second critical variable. One of the turbine configurations applied for is the Nordex N163, which has a tip height of 180 m, a hub height of 98.5 m and a rotor diameter of 163 m, giving a blade clearance of approximately 17 m above the turbine base at the lowest point of the rotor sweep. The receptor data is presented against these thresholds below.

Table 8-5:

Receptor elevation relative to the development	Elevation band (m OD)	Number of receptors	% of total
Below mean turbine base elevation	< 48.85	11	3.5%
Between mean turbine base and lowest blade sweep	48.85 – 65.85	140	44.9%
Above the lowest point of the rotor sweep	≥ 65.85	161	51.6%
TOTAL		312	100.0%

Of those 51% above the the rotor sweep the figures are even more concerning:

Table 8-6:

Height above lowest blade sweep	Elevation band (m OD)	Number of receptors	% of total
Up to ~9 m above sweep	65.85 – 75	51	16.3%
~9–24 m above sweep	75 – 90	74	23.7%
More than ~24 m above sweep	≥ 90	36	11.5%

Of the 312 identified receptors, only eleven sit below the mean turbine base elevation; the remaining 301 are at the same elevation or above, and 161 — more than half — sit above the level at which the lowest point of the rotor sweep passes. An assessment that treats all receptors as ground-level observers of structures on level terrain systematically understates effects in a bowl landscape. Elevation strips away the factors that normally soften turbine visibility. A dwelling sitting above the turbine bases sees a greater proportion of each structure; the turbines are more likely to stand against open sky than against a terrain backdrop and the perceived scale of the development increases accordingly. An assessment that assigns sensitivity and magnitude ratings without regard to this relationship is, to that extent, incomplete.

8.3.3 Receptor Clustering

Presenting 312 dwellings individually would be unworkable for the Commission and is unnecessary. The receptors have been grouped into **21 clusters**, each tied to a surveyed vantage point from which representative imagery has been captured. The cluster framework, the classification system applied to it, and the resulting findings are presented in Part C of this report. For present purposes, the relevant point is that the geography of the affected population is known, mapped and quantified — and was equally knowable to the applicant.

Interactive map showing 312 receptors clustered around 28 vantage points for the Ballincor Wind Farm visual impact assessment

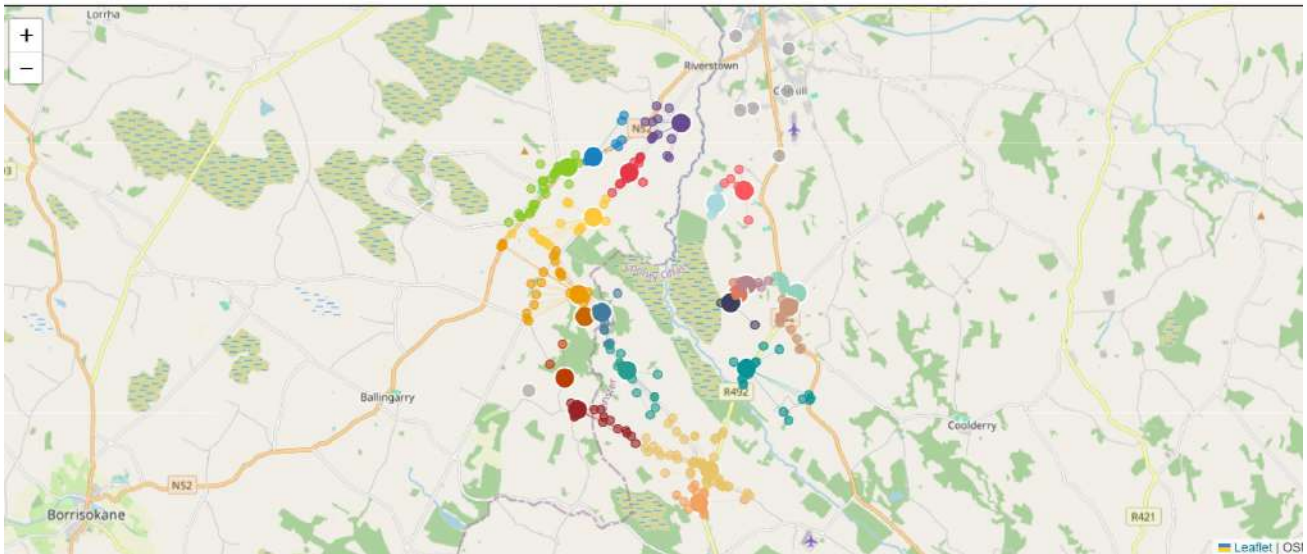


Figure 8-26: *The 21 receptor clusters, colour-coded, each linked to a surveyed vantage point.*

8.4 The Existing and Permitted Wind Energy Context

The proposed development would not enter an empty visual field. Two other wind energy developments already occupy, or will shortly occupy, the same visual envelope as the proposed turbines.

- The **Lacka Wind Farm** is operational and lies approximately 2.5 km to the west of the proposed site. Its eight turbines are already a presence in the views of the surrounding community, and the applicant's own LVIA acknowledges that it "already contributes to landscape character at a local level."
- The **Carrig Wind Farm** — seven turbines, approximately 6 km to the north-west — was granted permission in 2024 (ABP-318689-23). It is unbuilt but permitted, and as a committed development it forms part of the future baseline against which any new proposal falls to be assessed. Further afield, the recently constructed **Derrinlough and Cloghan** developments — adjacent schemes likely to be read as a single 28-turbine development — occupy the northern portion of the 20 km study area.

The geometry of the three nearest developments is the critical fact. Ballincor (proposed, 11 turbines), Lacka (operational, 8) and Carrig (permitted, 7) form a triangle a few kilometres across — **twenty-six turbines in total** — and the 312 receptors identified live within and around that triangle. The consequence is directional: a dwelling between the developments does not experience them as alternatives but as accumulation. Many households would face the proposed Ballincor array from their front windows, the operational Lacka turbines from the rear, and the permitted Carrig turbines on the oblique. The map below shows Carrig in Purple, Lacka in Red and Ballincor in yellow. Receptors in Blue.

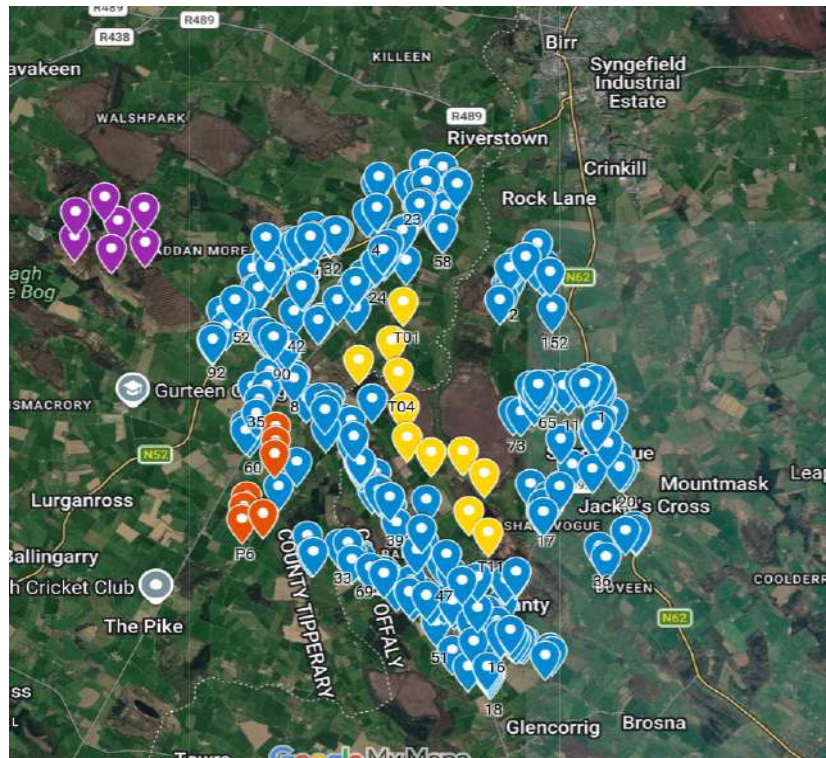


Figure 8-27

Appendix 12.2 presents the cumulative theoretical visibility of the proposed Ballincor Wind Farm in combination with all other wind farms in the study area. See image below. The purple area represents exposure to >66% of turbines.

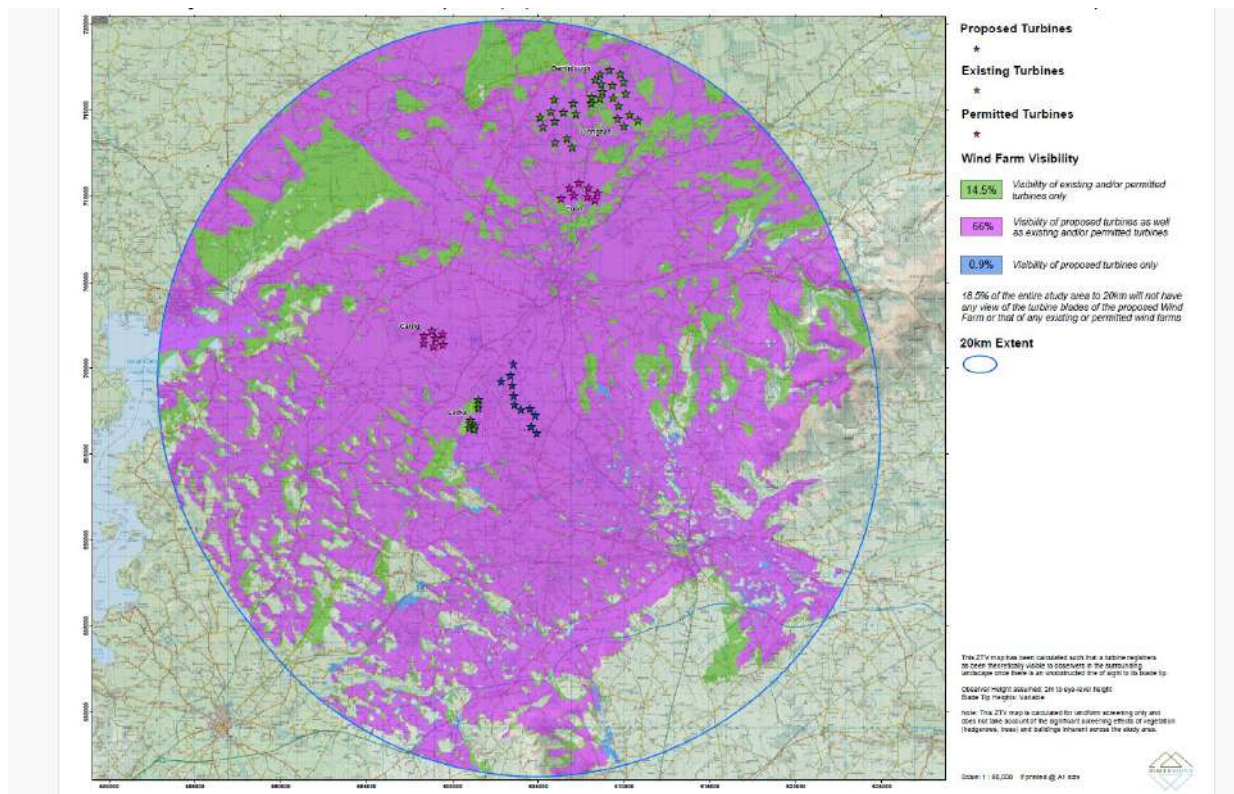
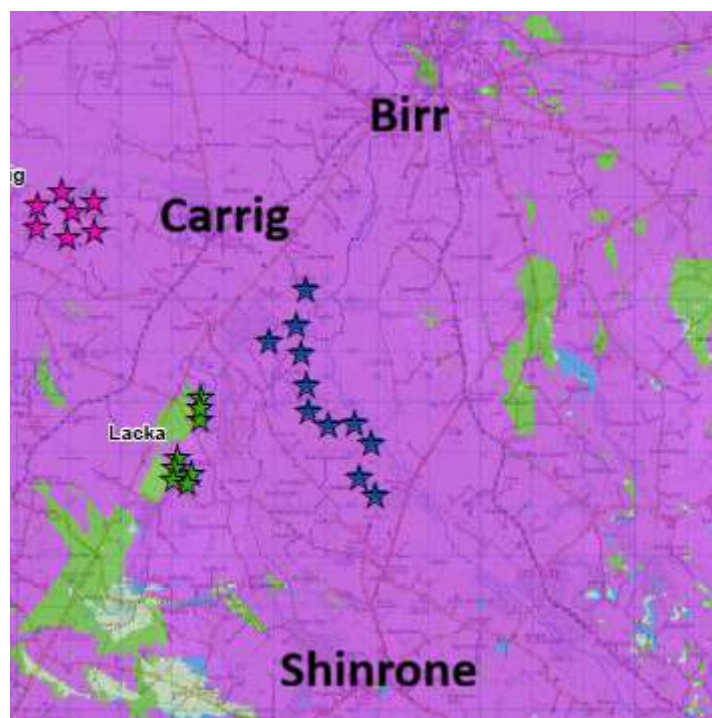


Figure 8-28**Figure 8-29**

According to the Applicant, all receptors in the wider area, including the primary population centres will be exposed to >66% of turbines cumulatively. Part C of this report will review the ZTVs from the individual receptor perspective, a study not conducted by the Applicant.

8.5 Methodology Standards — What a Competent Assessment Requires

This section sets out, neutrally, the standards against which the applicant's LVIA is to be measured. Three sources are relevant: the Wind Energy Development Guidelines 2006 (WEDG), which remain the operative statutory guidance under Section 28 of the Planning and Development Act 2000; the Guidelines for Landscape and Visual Impact Assessment, Third Edition (GLVIA3, 2013), which the applicant's LVIA states it follows; and the Landscape Institute's Technical Guidance Note LITGN-2024-01 (August 2024), which clarifies the correct application of GLVIA3 and is the most current professional guidance available.

8.5.1 WEDG 2006.

The WEDG2006 Guidelines prescribe a nine-stage landscape impact assessment. Four of those stages are critical to this application, and taken directly from the Guidelines, each imposes a clear requirement:

Stage 3 — Zone of Theoretical Visibility (ZTV): For turbines exceeding 100 m to tip (these are 180 m), the Guidelines require a ZTV extending to a 20 km radius; colour-coding by the number of turbines visible and a cumulative ZTV showing other wind energy developments in the area (Completed by the Applicant) . But the Guidelines also recommend a **"reverse ZTV"** — mapping visibility *outward from sensitive locations* — as a design-stage tool. The implication is clear: sensitive nearby locations should shape the design of the wind farm, not merely be assessed after the design is fixed.

Stage 5 — Viewpoint selection: Viewshed Reference Points must reflect County Development Plan designations, be located at varying distances, affording views from all directions and always present the worst case (most open) available view from any given location.

Stage 7 — Photomontages: The photomontage guidance reinforces the worst-case rule: vegetation or structures must not be placed between the camera and the development.

Stage 8 — Estimation of impact: The visual material on which impact judgements rest must fairly represent what will actually be experienced.

In addition, the WEDG's landscape-type guidance for Flat Peatland, the very character type the applicant claims for this site, warns against cumulative layouts that *"crowd and dominate the flat landscape"*.

8.5.2 GLVIA3.

Under GLVIA3, a visual effect is assessed by combining the sensitivity of the receptor with the magnitude of the change. Sensitivity depends on who is doing the viewing, and GLVIA3 is explicit that residents at home are among the most susceptible of all receptors — their exposure is constant, unchosen, and experienced in the place their daily life is anchored to. The applicant's own Chapter 12 restates this principle.

The Landscape Institute's 2024 guidance note clarifies how GLVIA3 must be applied (**LITGN-2024-01**). Seven clarifications bear directly on this assessment:

1. Scoring matrices may illustrate judgements but must not dictate them; every judgement needs reasoned narrative (Cl. 3(6)).
2. "Moderate" effects sit in the middle of the scale, so the assessor must explicitly justify whether they are significant or not (Cl. 3(5)).

3. An LVIA must not argue the case for the scheme; the planning balance is not its business (Cl. 2(4)).
4. Assessors owe a duty of impartiality under the Landscape Institute's Code of Practice (Cl. 8(1)).
5. Landscape policies — such as a "Not Suitable" designation — must feed into receptor susceptibility (Cl. 5(6)).
6. A night-time assessment is required where lighting could significantly affect visual amenity in a sensitive night-time environment (Cl. 8(2)).
7. Cumulative assessment means all development — existing, permitted and proposed — taken together (Cl. 7(3)).

The applicant's LVIA claims GLVIA3 as its own methodology.

8.6 Conclusions from Context

In summary five facts emerge from this Part, each objective, each mappable, and each of which any competent visual assessment of this site was required to engage with:

1. The site is designated 'Moderate/High Sensitivity' in the adopted Offaly Landscape Character Assessment, and is excluded from wind energy development by both County Development Plans, expressly on landscape and housing-density grounds.
2. 312 dwellings lie within the near study area, at a median distance of approximately 1.7 km from the nearest turbine, together with five population centres within approximately 5 km.
3. The site occupies a 'topographical bowl': surrounding receptors and population centres view it from level or elevated positions, increasing rather than diminishing visual exposure.
4. No effective screening is possible anywhere in the receiving landscape against structures of 180 m, and such incidental vegetation screening as exists is seasonal and was assessed only at its summer maximum.
5. Two other wind energy developments — Lacka and Carrig already occupy or will occupy the same visual envelope, such that many of the same 312 dwellings will experience turbines from multiple directions.

These are not contested matters of opinion; they are facts of public record and physical geography. A visual impact assessment that engaged honestly with these five facts would have proceeded from high receptor sensitivity, near-field assessment density proportionate to the resident population, conservative treatment of screening, explicit treatment of elevation, and receptor-level cumulative analysis. Part B demonstrates that the applicant's assessment did none of these things — and that each departure operated in the same direction: towards understatement of effect.

PART B — THE APPLICANT'S APPROACH: CRITIQUE

Chapter 12 of the EIAR comprises a desktop and field-based landscape baseline; a 20 km study area with a Zone of Theoretical Visibility; 27 Viewshed Reference Points (Table 12.6) with accompanying photomontages and viewpoint-by-viewpoint assessments (Appendix 12.1); a sensitivity/magnitude significance matrix (Table 12.4); a summary of operational visual effects (Table 12.7); and a cumulative effects section (Section 12.7) supported by a cumulative ZTV (Figure 12.12). The LVIA concludes that landscape effects, visual effects on every receptor group, and cumulative effects are all 'Not Significant'.

The critique that follows is not that the applicant adopted the wrong framework. It is that, at each point where the stated framework met the facts of this site, the assessment departed from its own stated principles and that every departure operated to reduce the assessed level of effect. When a methodology is stated correctly but applied selectively, the problem is not the method but the reliability of every conclusion built on it.

8.7 Misclassification of the Landscape and its Sensitivity

8.7.1 The landscape characterisation

The LVIA classifies the site within the WEDG "Flat Peatland" landscape character type with elements of "Hilly and Flat Farmland," and describes the receiving environment as a robust, productive rural landscape. Part A has set out why this characterisation is incomplete: the landscape is settled, the site sits in a bowl overlooked from rising ground, and 312 dwellings surround it. The "Flat Peatland" framing matters because the WEDG strategies for that landscape type presume sparse habitation and visual robustness. These presumptions do not hold here. A landscape type assigned at desk level cannot substitute for the observable facts of habitation and topography. In any event the WEDG's own Flat Peatland cumulative guidance (no crowding or domination of the flat landscape) condemns the chosen linear, maximal layout, as set out at A2.2.

8.7.2 The sensitivity classification conflict

Chapter 12 states that "the proposed wind farm lies within the Moderate and Low Sensitivity classifications" of the Offaly Landscape Sensitivity Assessment. The adopted county sensitivity mapping shows the Ballincor area within the 'Moderate to High Sensitivity' classification. This is not a difference of professional opinion; the Commission is invited to inspect both. If the applicant's statement is wrong, then a foundational input to every sensitivity judgement in the chapter is wrong, and the cascade of consequences is set out at B5.

8.7.3 Stated principles versus applied ratings

The deeper problem is internal to the chapter. The LVIA's own methodology section states that residents at home are among the most susceptible visual receptors.

Susceptibility of Visual Receptors to change

In accordance with GLVIA3 visual receptors most susceptible to changes in views and visual amenity are:

- *“Residents at home*
- *People, whether residents or visitors, who are engaged in outdoor recreation, including use of public rights of way, whose attention or interest is likely to be focussed on the landscape and on particular views*
- *Visitors to heritage assets, or to other attractions, where views of the surroundings are an important contributor to the experience*



The chapter lists among its criteria for the value of a view:

- recognised scenic value (expressly including CDP designations, which the chapter describes as representing a public consensus arrived at through consultation)
- views from within highly sensitive landscape areas
- and intensity of use

Each of these criteria, applied honestly to this site, points upward: the CDP designations exist and are adverse to the development; the site lies within a Moderate to High Sensitivity landscape area; and 312 dwellings within the near field constitute intensive residential use of the visual resource by any rural standard.

Yet when the ratings are assigned, every near-field local community viewpoint, VP20 and VP22 at 1.0 km and VP21 at 1.3 km from the nearest turbine, receives a sensitivity of 'Medium-low' on the stated basis that the views represent *"everyday views of people who live in the local area"* comprising *"typical rural scenes of farming and forestry interspersed with peat bogs."* Two distinct errors are embedded in that single sentence.

1. It applies a landscape-quality discount to what GLVIA3 defines as a receptor-susceptibility question: a family living within approximately 1 km of an array of 180-metre turbines has high susceptibility to changes in their view regardless of whether the field pattern around them is "typical." The ordinariness of a landscape does not diminish the susceptibility of the people who live in it; if anything, the everyday view from a home is precisely the view GLVIA3 protects most strongly.

2. It inverts the chapter's own value criteria: "everyday views of people who live in the local area" describes exactly the continuous, involuntary, residential exposure that the methodology section identifies as maximally susceptible. See image below, VP20b, to illustrate the point



Figure 8-30:VP20B L1071 at Doughkill: taken within 2km of site Ballincor Windfarm Montages Book 2

VP20	L1071 at Doughkill This view is experienced by local road users and local residents and features open agricultural fields extending into the middle ground, which are defined by hedgerows and mature trees. A forest plantation then forms a flat vegetated skyline to the southeast. A cluster of farm buildings and a dwelling are glimpsed through gaps in the vegetation. In the background, a gentle hill covered with wooded patches and agricultural fields is visible.	Medium-low	This is a close view of the proposed wind farm from 1km away looking along the long axis of the array. The upper profile of the structures within the proposed substation and the associated lightning rods can also be seen rising above the treeline in the near middle distance. The turbines are seen at a dominant but not overbearing scale in this broad rural context. Indeed, they are seen in a clear and legible manner with a strong sense of perspective generated between the nearest and furthest turbines due to the scale differential between them. This emphasises the depth of the array and the provides a sense of space and distance to reinforce the extent of receiving context. There is a marked increase in the scale and intensity of built development within this visual setting, but it is a broad and productive rural context that can accommodate the wind farm in terms of scale and function. Overall, the magnitude of visual impact is deemed to be High and the quality of effect, Negative.	Substantial-moderate/ Negative/ Long-term	Not Significant
VP21	D409 at Charanserie		The proposed turbines and most most are seen at a		

LITGN-2024-01 confirms this critique: *susceptibility relates to the receptor, not to the development type or the perceived quality of the landscape (and existing county studies, whichever way they cut, are background rather than a substitute for project-specific receptor assessment — Cl. 5(4))*. The chapter states the right principles. It then assigns ratings that those principles cannot produce, and Appendix 12.1 does not supply the reasoned narrative that LITGN-2024-01 Cl. 3(6) requires to bridge the gap.

The suppressed ratings must also be read against the composition of the full viewpoint set itself. Of the 27 viewpoints selected, only 5 lie within 2 km of the nearest turbine. This in a landscape where 216 of the 312 identified dwellings (69%) lie within that distance. Were the

applicant to choose vantage points to honestly assess Receptor sensitivity they would have adopted views like the one below – using Windplanner software licensed by Greater Birr Wind Action Group.



Figure 8-31: Image taken from R101 Windplanner software

The residential population was therefore doubly diminished: first by a viewpoint distribution that allocated it five viewpoints out of twenty-seven, and then by the assignment of "Medium-low" sensitivity to each of the five without justification and rationale.

The two judgements compound. Had near-field residents been properly represented in the viewpoint set and correctly rated, or properly rated at the five viewpoints they were actually given, significant effects would have emerged. The combination of under-representation and under-rating is the only configuration that produces none.

An assessment in which the two discretionary judgements most consequential for residents both resolve in the developer's favour — and in which no reasoned narrative explains either — cannot be treated as an impartial application of its stated methodology.

8.8 Treatment of the Development Plan Designations

The LVIA acknowledges both exclusion designations and then argues they should be set aside. For Offaly, it asserts that *"the proposed wind farm appears to meet all of the individual criteria"* of the Wind Energy Strategy and that *"it is reasonable to consider that the project can be assessed on its own merits given the broad-brush approach to establishing wind energy deployment zones."* For Tipperary, relying on the inspector's report in the Carrig case (ABP-318689-23), it asserts that "limited weight can be given to the Tipperary Wind Energy Strategy map." The argument fails for three reasons:

1. **This is advocacy, not assessment:** GLVIA3 paragraph 8.9, as restated by LITGN-2024-01 Cl. 2(4), is explicit that an LVIA must not include advocacy for the scheme and that conclusions on the planning balance/assessment/position, do not belong within it. A chapter that argues for the discounting of adverse designations has stepped out of the role of assessor and into the role of advocate, and its conclusions must be read accordingly.
2. **The substance of the argument fails on its own terms:** The claim by the developer that the development site "appears to meet all of the individual criteria" of the Offaly strategy is untrue and lacks any evidential substance. A full analysis of the sieve-mapping exercise conducted by Offaly CC was presented in Chapter 2 and directly refutes this assertion. Furthermore an individual application by a vested party cannot collaterally re-run the rigorous, independent and democratically representative plan-making exercise to a different conclusion.
3. **The Carrig precedent does not transfer:** The inspector in ABP-318689-23 criticised the Tipperary classification because that site's exclusion rested "solely on the fact that the site is peatland" without regard to the many unique and site-specific criteria that are inherent in the site. The Ballincor exclusions rest on entirely different and cumulative grounds. This is an attempt to extend a site-specific criticism into a general licence to disregard wind energy strategies even when nothing in the analysis supports that extension.

8.9 Viewpoint Selection and the Suppression of Visual Effect

Viewpoint selection is the single most consequential exercise of judgement in any LVIA. The viewpoints chosen determine what is photographed, what is assessed and therefore what can be found. The WEDG is explicit about how that judgement must be exercised and cites viewpoints at varying distances, reflecting Development Plan designations, and always presenting the worst-case (most open) available view. Measured against those requirements, and against the receptor geography established in Part A, the applicant's viewpoint set fails in three distinct ways, each examined in turn below:

The review attributes the benign result to a recurring set of selection choices:

- **The distance distribution (B3.1).** 11 of 31 viewpoints sit beyond 10km from the nearest turbine, where the group argues turbines become visually insignificant and, in haze or bright sun, fade out altogether. The viewpoints are concentrated at distances where effects are inherently diminished — a median of 7.3 km, against a receptor population whose median distance is 1.7 km.
- **The worst-case view requirement (B3.2).** The viewpoints that were selected do not present the worst-case views available, and the entire photomontage set was captured at its seasonal best.
- **Atmospheric conditions.(B3.3)** Most images were taken on sunny, hazy days where white turbines blend into a pale blue sky — whereas Ireland is overcast most of the year, against which white turbines would stand out.
- **Foreground screening. .(B3.4)** Several viewpoints are placed behind mature trees, hedgerows or rising ground that obscure the turbines, when a position a short distance away (up a hill, further down a road) would have revealed them.
- **Absence of scale reference.** Few montages include houses or known structures, denying the reader any way to judge the true scale of a 180m turbine.
- **What was not assessed at all .(B3.5).**The densest receptor clusters, the large population centres and the night-time environment have no effective representation in the assessment.

Each is considered and demonstrated below.

8.9.1 The distance distribution

Table 12.6 pg 42, lists the 27 selected viewpoints with their distances to the nearest turbine.

Table 8-7: Distance of the 27 Applicant Viewpoints

Distance band	Number of viewpoints	Viewpoints / details
Within 2 km	5	VP20 – 1.0 km; VP22 – 1.0 km; VP21 – 1.3 km; VP2 – 1.8 km; VP23 – 1.9 km
Between 2 km and 5 km	2	VP17 – 3.7 km; VP24 – 3.8 km
5 km or beyond	20	20 of the 27 selected viewpoints are located 5 km or more from the nearest turbine
Beyond 10 km	11	11 of the 27 selected viewpoints are located more than 10 km from the nearest turbine
Beyond 13 km	4	VP4 – 13.3 km; VP27 – 14.4 km; VP12 – 15.1 km; VP1 – 16.3 km

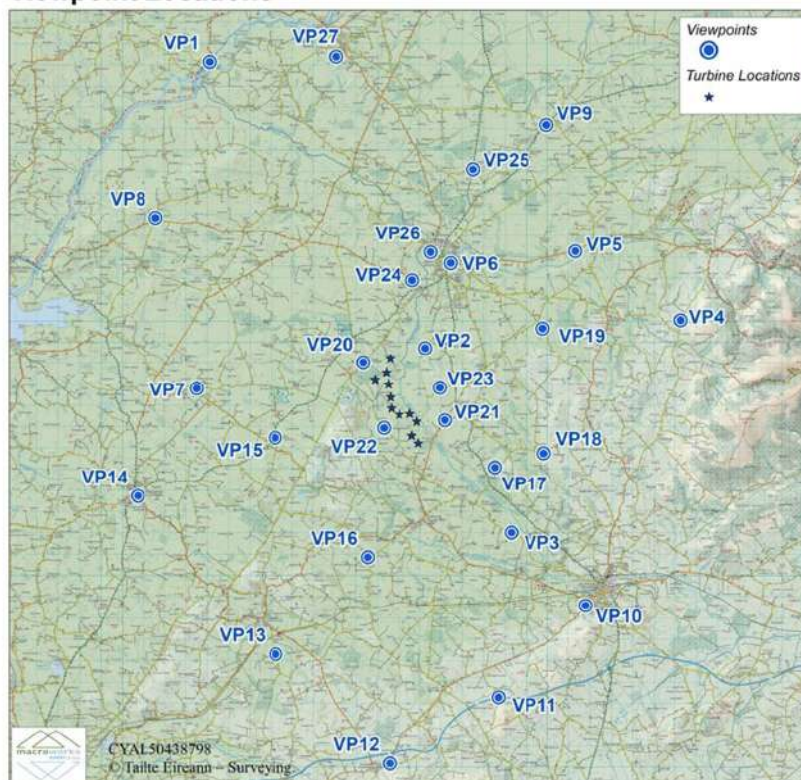
Viewpoint Locations

Figure 12.10 Viewpoint location map

The median viewpoint distance is 7.3 km; the mean is approximately 8.0 km. Set that against the geography of the affected population, 312 dwellings at a median distance of approximately 1.7 km. The applicant assessed this development from a median distance more than four times greater than the median distance at which the affected community lives. Of 27 viewpoints, only 7 fall within the 5 km radius the chapter itself treats as the local community zone.

The chapter's own Table 12.7 demonstrates why the distribution matters: every "Imperceptible" and "Neutral" finding in the assessment occurs at distance, and the only finding approaching significance (VP20, Substantial-moderate) occurs at the nearest viewpoint. Distance is doing the analytical work in this LVIA. The selection of distances was therefore the selection of conclusions.

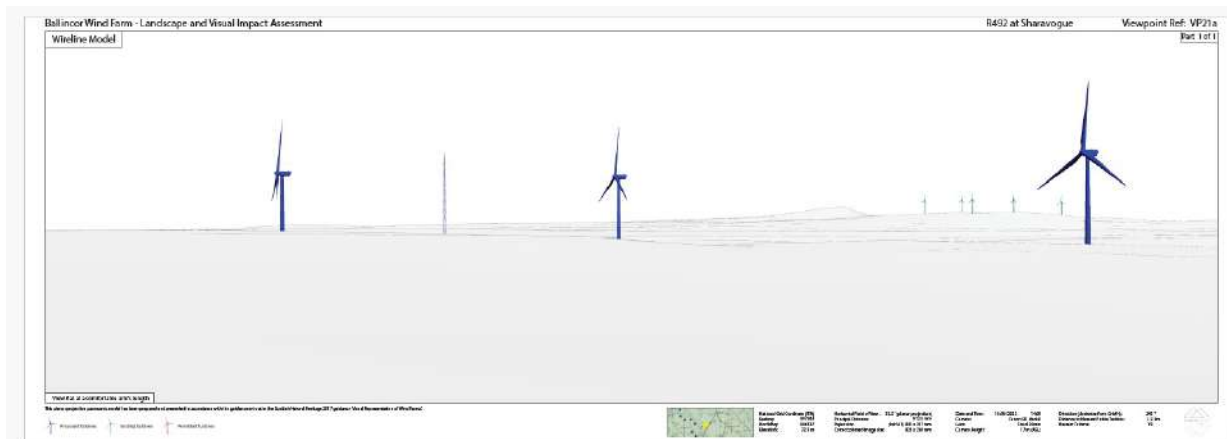
8.9.2 The worst-case view requirement

The WEDG requires that each viewpoint "should always present the worst case (most open) available view from any given location," and that photomontages must not place vegetation or structures between camera and development. Several of the near and middle-distance viewpoints rely on oblique angles or foreground vegetation, and the assessment then credits that screening in its magnitude findings

There are 2 issues evident from VP21a below. The first is the absence of the Lacka turbines in the image.



The wireframe image below clarifies the matter.



The image above is taken along the R492. 200m further on the road reveals this street view below.



Figure 8-32: Streetview – 200m from VP21 Photomontage

10 houses all within the 1km range are clustered at this point just 200m further down the road.



Figure 8-33: *Housing density beside VP21 – all avoided*

In a landscape where the only available screening is deciduous hedgerow and treeline, summer-only photography presents every viewpoint at its seasonal best case. The WEDG worst-case requirement is thereby inverted twice over: in viewpoint placement and in seasonal timing.

8.9.3 Atmospheric Conditions

The images below taken from Applicants Photomontage show how visual effects can impact the reality and how atmospheric conditions will screen out the visibility of Turbines (blue sky and hazy background). Compare Figure 8-34 and Figure 8-35.



Figure 8-34. Applicants VP11 taken from 12.5km -turbines hardly visible against the blue sky & haze in the distance



Figure 8-35 RWE -VP11 -**Zooming in** from the exact position would have provided more detail for the reader



Figure 8-36 Applicants VP10 R445 at Limerick Road Roundabout

In VP10 the photomontage's wind turbines are almost not visible, at that distance, due to atmospheric conditions, they fade into light blue background. It gives the reader a false sense that views from this general VP location will provide negligible visual impact, which is incorrect.



Figure 8-37 *Zooming in* from the same VP, but still using the barn and electrical pole in the foreground, the turbines now come into focus and the reader can judge the scale against the structures.

8.9.4 Foreground Screening



Figure 8-38a: *Applicants choice of Screening. 50 m up the road would expose 3 turbines up close and a full array across the landscape*



Figure 8-38b -VPg taken from the bottom of the hill moving + 200m up the hill to the crest would have made 7 turbines fully visible

8.9.5 What was not assessed

The preceding sections examined the viewpoints the applicant chose. This section examines what **no** viewpoint was asked to see. Measured against the receptor geography established in Part A, the gaps are not incidental. The locations missing from the assessment are precisely those where the affected population is most concentrated and where effects would be greatest; the densest receptor clusters, the town of Birr and the villages of Shinrone and Riverstown, and the night-time environment experienced by every one of the 312 surrounding households. Each omission is examined in turn.

8.9.5.1 The densest receptor clusters have no viewpoint.

The map below shows all receptors within a 5km range. The black boxes represent the gaps in VPs chosen by the Applicant.

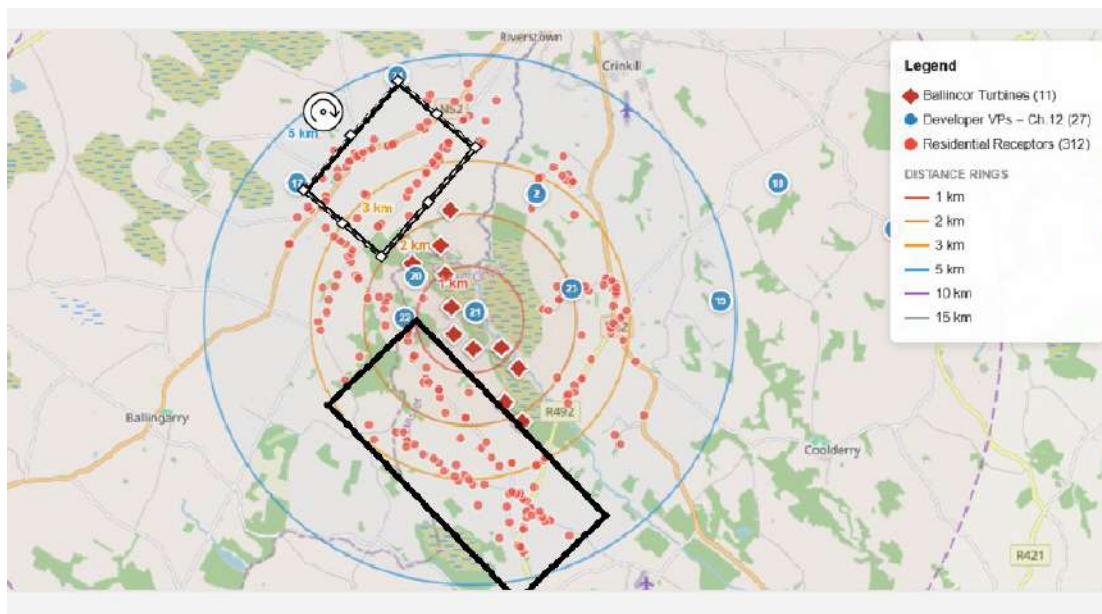


Figure 8-39

These two large clusters account for almost two thirds of receptor dwellings. An assessment whose viewpoint set misses the locations where the affected population is concentrated cannot claim to have assessed the effect on that population.

8.9.5.2 Birr is effectively unassessed. A town of approximately 5,000 people lies 4–5 km north of the site, on rising ground overlooking it. The town's representation in the viewpoint set consists of VP6 at Birr Rugby Club (5.3 km, on the town's southern edge) and VP26 within Birr Castle Demesne (5.4 km, an enclosed parkland setting where screening is at its maximum). No viewpoint addresses the residential areas, approaches or elevated southern aspect of the town itself. The result is that the largest single concentration of visual receptors in the study area is represented by a rugby pitch and a walled demesne.

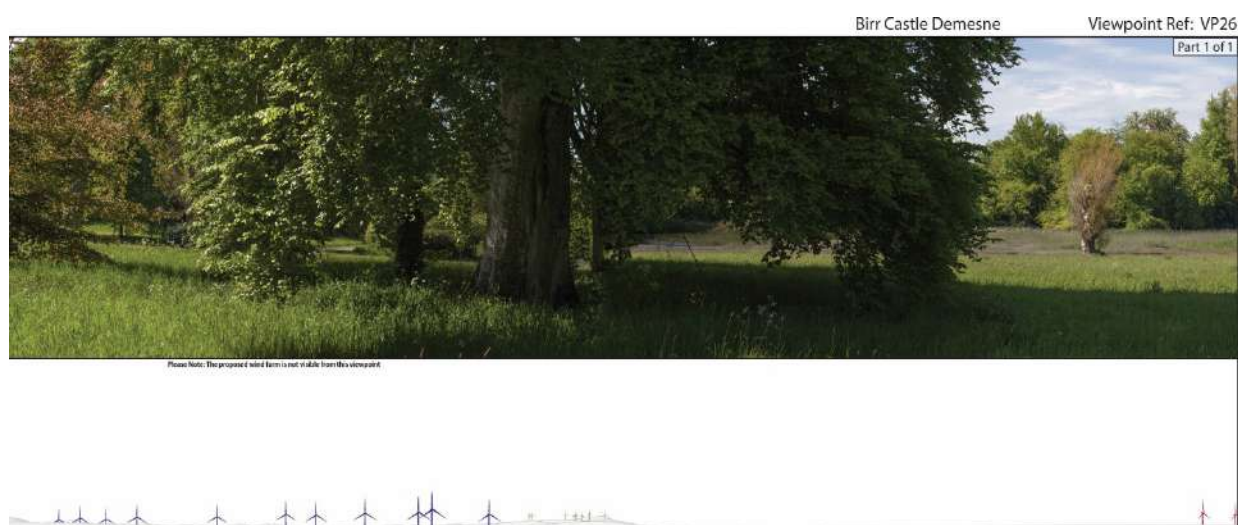


Figure 8-40 VP26 Image representing Birr town: taken a few meters from mature trees beside Birr Castle Demesne

Many parts of Birr town are elevated and images like those below are possible at street view level.



Figure 8-41: Street view image from Wood Lane Close- Birr Heritage Town

Shinrone is entirely unassessed. See below.



Figure 8-42 : Shinrone and view of Turbines

Riverstown is entirely unassessed. See below.



Figure 8-43: Riverstown and view of Turbines

8.9.5.3 The night-time assessment is superficial and misdirected.

The chapter disposes of aviation lighting in a single paragraph (Section 12.4.3.3):

Night time Visual Effects from lighting

Red aviation lighting will be provided on the hubs of outer turbines within the array. This is of a low intensity designed to be seen from distance but not to illuminate the surrounding area. It can also be baffled such that it is not readily visible from the ground below the turbines.

12-53 | Page



TOBIN

Although this is a rural area with relatively low levels of ambient lighting, it is not an area subject of a dark skies designation. Effects from turbine aviation lighting will be subtle and dispersed and are not considered to generate significant effects on nighttime visual amenity and enjoyment of dark skies.

No night-time photomontage or visualisation was produced; no viewpoint was assessed after dark; no receptor appears anywhere in the analysis; and Table 12.7 contains no night-time entry. Each of the three assertions offered in place of an assessment fails on inspection. The absence of a dark-skies designation is not the test: LITGN-2024-01 Cl. 8(2) directs the assessment to the sensitivity of the receiving night-time environment itself, and the chapter's

own concession that this is a rural area of "*relatively low levels of ambient lighting*" is a concession that the receiving environment is sensitive. "*Can be baffled*" is conditional, not committed and baffling in any event reduces visibility only from directly beneath the turbines, which assists none of the 312 dwellings at 1–3 km and is meaningless for the elevated receptors who will view the lit hubs at or near their own eyeline. And lighting confined to the "outer turbines" of an eleven-turbine linear string means illuminated structures at each end of the array: the lights will bracket the full horizontal extent of the development, drawing its outline in red across a dark rural skyline, nightly, for 35 years. A one-paragraph dismissal resting on a designation test the guidance does not set, a mitigation that is neither proposed nor relevant to the affected receptors, and no visual evidence whatever, is not an assessment of that effect

8.9.6. Summary Conclusion: Viewpoint Selection, Omission and the Suppression of Visual Effect

Viewpoint selection is not a neutral or technical afterthought in an LVIA. It is the exercise that determines what the decision-maker is permitted to see, what is assessed, and ultimately what conclusions can be reached. In this case, the applicant's viewpoint set does not provide a fair, representative or worst-case assessment of the likely visual effects of the proposed Ballincor turbines on the receiving community.

The review of the applicant's photomontages demonstrates that the benign conclusions reached in the LVIA are substantially driven by viewpoint selection. The selected viewpoints are weighted towards distance, obstruction and visually favourable conditions. Many are taken from locations where turbines are naturally diminished by distance, screened by trees, hedgerows or rising ground, or set against bright, hazy skies where white turbines visually recede. This is particularly significant where the affected receptor population is concentrated much closer to the proposed turbines than the median distance of the viewpoint set. The applicant has therefore assessed the development from locations that are, in many cases, materially less exposed than the places where people actually live, travel and experience the landscape.

The WEDG requirement that viewpoints should present the worst-case, most open available view has not been met. In several instances, a modest adjustment in position, moving a few hundred metres along a road, up a rise, or away from foreground vegetation, would have produced a materially different and more exposed view of the proposed turbines. Instead, the selected images frequently use intervening trees, woodland, hedgerows, terrain or oblique angles to reduce the apparent magnitude of effect. The assessment then relies on that

screening to support lower visual-impact findings. This reverses the logic of the WEDG: rather than selecting the most open available representative view, the viewpoint selection repeatedly captures views where the development is softened, obscured or visually minimised.

The photomontage review also shows that the images often fail to give the reader adequate scale reference. The absence of nearby houses, roads, buildings, poles or other familiar structures makes it difficult to understand the true scale of turbines of approximately 180 metres in height. Where the same viewpoints are examined more closely, or where nearby structures are visible, the turbines become more legible and their scale, prominence and relationship to the settled landscape are materially clearer.

However, the problem is not limited to the viewpoints selected. It also lies in what the applicant chose not to assess at all. Measured against the receptor geography established in Part A, the omissions are not incidental. The locations missing from the assessment are precisely those where the affected population is most concentrated and where visual effects would be expected to be greatest. The densest receptor clusters within the 5 km study area have no effective viewpoint representation, despite accounting for a substantial proportion of the surrounding dwellings. An assessment that misses the locations where the affected population is concentrated cannot claim to have assessed the effect on that population.

The same pattern is evident in the treatment of the main settlements. Birr, the largest population centre in the study area, is effectively unassessed. A town of approximately 5,000 people, located 4–5 km north of the site on rising ground overlooking the development area, is represented only by a viewpoint at Birr Rugby Club on the town's southern edge and a viewpoint within Birr Castle Demesne, an enclosed parkland setting where screening is at its maximum. No viewpoint addresses the residential areas, approaches or elevated southern aspect of the town itself. The result is that the largest single concentration of visual receptors in the study area is represented by a rugby pitch and a walled demesne. Shinrone and Riverstown are entirely unassessed, despite being identifiable settlements within the receiving landscape.

The night-time environment is also not properly assessed. Aviation lighting is dismissed in a single paragraph, with no night-time photomontage, no night-time viewpoint, no receptor-based analysis and no entry in the visual-effects table. This is a serious omission. The absence of a formal dark-skies designation is not a substitute for assessing the sensitivity of the receiving night-time environment. The applicant's own description of the area as rural, with relatively low levels of ambient lighting, points to a sensitive receiving environment. In such a

setting, red aviation lights on turbines of this scale would not be a minor technical detail; they would introduce a new and repeated night-time visual effect across the rural skyline.

Taken together, the viewpoint selection and omissions materially undermine the reliability of the LVIA. Distance reduces prominence; haze reduces contrast; foreground screening reduces visibility; the absence of scale reference reduces comprehension; and the omission of key receptor clusters, settlements and night-time views removes the most affected visual receptors from meaningful assessment altogether. The resulting LVIA findings are therefore not simply the product of objective visual analysis. They are the product of what was selected for assessment, what was visually minimised within those selections, and what was left out entirely.

8.10 Sensitivity, Magnitude and the Suppression of Significance

The preceding sections examined *Where and How* the applicant chose to assess. This section examines *What* the applicant did with the judgements themselves — the sensitivity, magnitude, quality and duration ratings from which every significance finding is built. Under the chapter's own methodology, these ratings are the inputs to its Table 12.4 matrix; if the inputs are suppressed, the conclusion of "Not Significant" follows automatically, whatever the landscape actually shows. The section first sets out the findings as the chapter made them (B4.1), and then demonstrates five respects in which those findings cannot be sustained:

- **The sensitivity input is wrong (B4.2)** — correcting the unjustified "Medium-low" rating carries multiple viewpoints across the chapter's own significance threshold.
- **The magnitude ratings are independently suppressed (B4.3)** — the near-field ratings sit below the chapter's own definitions of the situation they describe.
- **"Neutral" quality findings contradict the chapter's own default (B4.4)** — that wind energy effects are "almost always negative."
- **"Moderate" findings are left unexamined (B4.5)** — contrary to LITGN-2024-01's requirement for explicit justification.
- **Duration is conceded and then ignored (B4.6)** — a 35-year effect weighted identically to a transient one.

The common thread is the one identified at the outset of Part B: at each point of judgement, the rating assigned sits below what the chapter's own definitions and stated principles would produce, and no reasoned narrative accounts for the gap.

8.10.1 The findings as made

Table 12.7 is the summary output of the entire visual assessment. For each of the 27 viewpoints it records the four judgements from which significance is derived

1. The sensitivity of the receptor at that location
2. The magnitude of the visual change,
3. The quality of the effect (negative, neutral or positive) and
4. The duration.

Sensitivity and magnitude are then combined through the chapter's Table 12.4 matrix to produce a significance rating on a scale running from Imperceptible Slight, Moderate, Substantial to Profound. This scale matters because only effects rated **Substantial or above**

are treated as *significant* in EIA terms. Anything below that line, however adverse, is folded into a conclusion of "Not Significant" and effectively falls out of the decision.

The extract below shows the findings for the near-field viewpoints — those closest to the development and therefore those representing the surrounding community:

VP2	1.8	Medium-low	Medium	Moderate-slight/ Negative/ Long-term
VP20	1.0	Medium-low	High	Substantial-moderate/ Negative/ Long-term
VP21	1.3	Medium-low	High-medium	Moderate/ Negative/ Long-term
VP22	1.0	Medium-low	High-medium	Moderate/ Negative/ Long-term
VP23	1.9	Medium-low	High-medium	Moderate/ Negative/ Long-term

The findings in Table 12.7 sit, without exception, below that line. The highest rating anywhere in the assessment is **Substantial-moderate** — one step short of significance — and it occurs at VP20, the viewpoint nearest the turbines (1.0 km). Every other viewpoint returns Moderate or less. The result is that an eleven-turbine development of 180-metre structures, with 312 dwellings within 3 km, is assessed as producing **not a single significant visual effect at any location**, and the chapter concludes "Not Significant" for every receptor group: residents, road users, scenic designations and amenity sites alike.

Two features of this outcome should be noted before the individual ratings are examined. First, its **totality**: not one effect, anywhere, crosses the threshold. Second, its **proximity to the line**: the nearest viewpoint lands exactly one increment below significance.

A conclusion that depends on every judgement falling just short, *none* of the 27 falling the other side, is a conclusion that the following sections test against the chapter's own definitions. It does not survive the test.

8.10.2 The sensitivity input is wrong, and the conclusion falls with it

We established previously that the Medium-low sensitivity rating at the near-field viewpoints cannot be derived from the chapter's own stated criteria. Once we correct that misclassification from medium-low to medium the consequence is decisive.

Using the applicant's own Table 12.4 matrix.

At VP20 (High magnitude): Medium sensitivity yields ****Substantial****; High sensitivity yields ****Profound-substantial****.

At VP22 and VP21 (High-medium magnitude): Medium sensitivity yields ****Substantial-moderate****; High sensitivity yields ****Substantial****.

In other words, correcting the single input from 'Medium-Low' to Medium or High carries multiple viewpoints across the chapter's own significance threshold. The conclusion that visual effects are "Not Significant" is not a robust finding that survives reasonable variation in judgement; it is wholly dependent on the one rating the chapter fails to justify.

8.10.3 The magnitude ratings are independently suppressed

Table 12.3 Magnitude of Visual Effect

Criteria	Description
Very High	The proposal obstructs or intrudes into a large proportion or critical part of the available vista and is without question the most noticeable element. An extensive degree of visual change will occur within the scene completely altering its character, composition and associated visual amenity
High	The proposal obstructs or intrudes into a significant proportion or important part of the available vista and is one of the most noticeable elements. A considerable degree of visual change will occur within the scene substantially altering its character, composition and associated visual amenity

"High Magnitude", is defined in Chapter 12 above as *"proposal obstructs or intrudes a significant proportion of the vista, a considerable degree of visual change, substantially altering the scene"*

At VP22, 1.0 km from the nearest of eleven turbines arranged in a line across the direction of view. The two images below break down the vista into two separate arcs but should be viewed as a side by side viewpoint. Each turbine subtends an apparent height several times that of any existing landscape element, and the array occupies a wide horizontal arc of the vista.



The rating assigned is *High-medium*. The chapter's own definition of High describes this situation, conservatively; its definition of Very High ie '*intrusion into a large proportion of the vista, without question the most noticeable element*' should be engaged. The same pattern recurs at VP21 and VP23. No reasoned narrative explains the discount.

8.10.4 "Neutral" quality findings contradict the chapter's own default

The chapter's methodology states that for wind energy development "*the quality of the landscape and visual effects will almost always be negative.*" Table 12.7 then assigns 'Neutral' or 'Neutral-Negative' quality at viewpoints where the ZTV shows open visibility at moderate range — VP15 (Knockshegowna GAA Club, 5.4 km): Imperceptible/Neutral; VP6 (Birr Rugby Club, 5.3 km): Neutral-Negative; VP19 (7.3 km): Neutral-Negative. The proposition that eleven 180-metre turbines at 5.4 km in open flat terrain produce '*no change*' in the quality of the visual environment is not explained; it is simply tabulated. Where an assessment departs from its own stated default, LITGN-2024-01 CL 3(6) requires the departure to be reasoned. It is not.

8.10.5 "Moderate" findings are left unexamined

LITGN-2024-01 Cl. 3(5) requires that effects falling in the middle of the significance range — exactly the "Moderate" findings returned at VP21, VP22 and VP23 — be the subject of explicit justification as to whether they are significant or not. The chapter provides no such justification; the 'Moderate' findings are treated as self-evidently not significant and swept into the global conclusion. Three viewpoints at 1.0–1.9 km from the development, each representing surrounding dwellings, each returning a mid-scale effect, received no individualised significance reasoning at all.

8.10.6 Duration is conceded and then ignored

The chapter classifies the effects as 'Long-term' on its own duration scale (15–60 years; the operational life sought is 35 years with permanent elements, access tracks and grid infrastructure, that will outlast decommissioning. Duration appears in every Table 12.7 cell and modifies nothing: a 35-year alteration of the daily outlook of 312 households is weighted identically to a transient effect. Treating duration as a recorded but inert label, rather than as a factor bearing on significance, is a further systematic understatement.

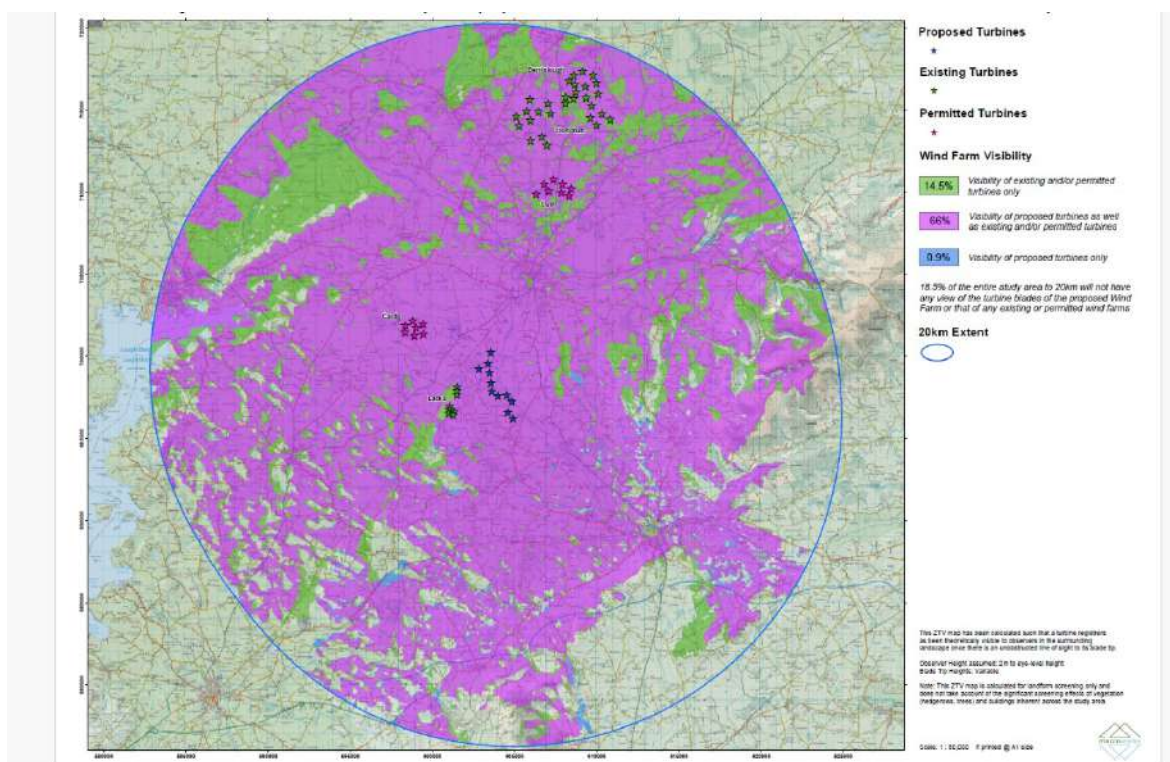
Summary

Table 12.7 is the determinative output of the entire visual assessment. Within it, every judgement that was open to discretion was resolved downward. The sensitivity ratings cannot be derived from the chapter's own criteria; the magnitude ratings sit below the chapter's own definitions of the scenes they describe; the quality findings contradict the chapter's own stated default; the Moderate findings escape the justification LITGN-2024-01 requires; and duration is recorded but never weighed. Correcting any one of these — most decisively the sensitivity input — carries the near-field viewpoints across the chapter's own significance threshold. The conclusion of "Not Significant" therefore rests not on the evidence but on a series of unexplained discounts, and it should be afforded weight accordingly.

8.11 Cumulative Assessment

Section 12.7 of the chapter disposes of cumulative effects in summary terms. It acknowledges the operational Lacka Wind Farm, describes the proposed (Ballincor) and existing (Lacka, Carrig) developments together as "modest scale developments" that "do not contribute to a marked change in landscape character," and concludes that the area "will not become a landscape that is defined by wind energy development." It produces a cumulative ZTV (Figure 12.12) see below, notes that it shows near-universal overlap of visibility between the proposed and existing developments and then discounts its own map as one that "considerably overrepresents actual cumulative effects."

Figure 8-44: Cumulative theoretical visibility of the proposed Ballincor Wind Farm in combination with all other wind farms in the study area



It is noted in passing that the chapter's cumulative narrative places Lacka at 2.5 km, while its own baseline description (Section 12.3.1.2) records the nearest Lacka turbine at 1.7 km from the proposed wind farm so the existing development is closer than the cumulative assessment ever acknowledges.

This treatment fails in four respects. Each is discussed below.

8.11.1 The assessment never reaches the receptors

Cumulative effects were assessed at viewpoint level only. The lived cumulative effect, however, is experienced at dwellings: a household between the developments will face Ballincor turbines from the front of the house, Lacka from the rear, with Carrig on the oblique. The receptor-level analysis presented in Part C shows that substantial numbers of the 312 dwellings will have simultaneous or sequential visibility of two, and in many cases three or more, developments — with combined totals at individual dwellings reaching the mid-twenties of turbines. Nothing in Section 12.7 engages with this at all. Every failure that follows is a consequence of this one: an assessment that never asks what any actual household will see cannot answer the cumulative question. The map below shows the cumulative reality: twenty-six turbines across three developments, with the 312 receptors of the Ballincor near field positioned between them.

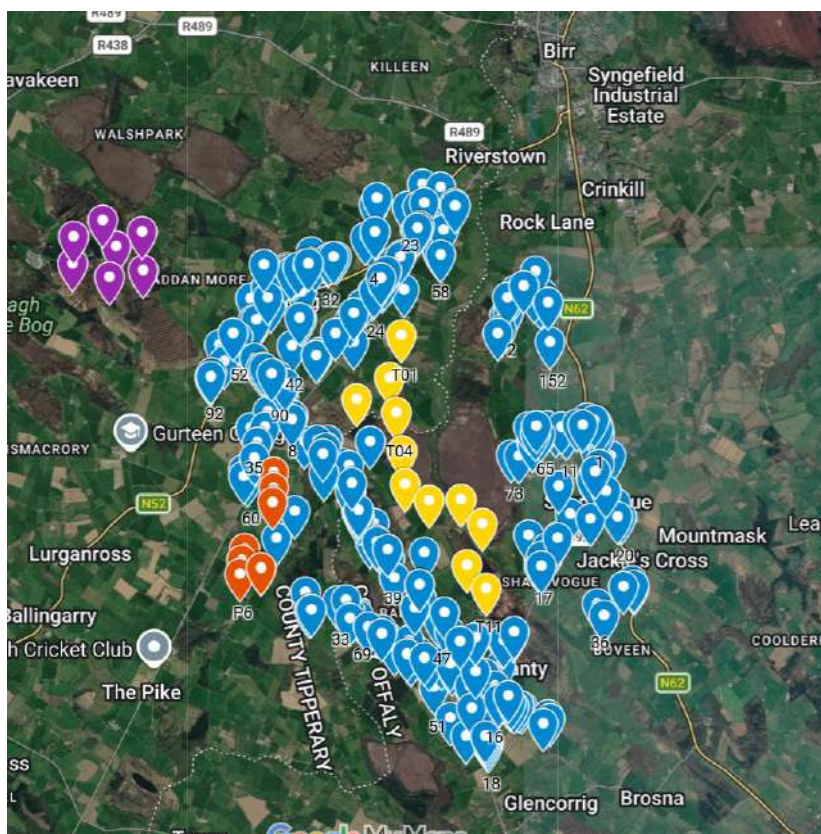


Figure 8-45: All 3 windfarms and 312 receptors

The cumulative reality: twenty-six turbines across three developments, with the 312 receptors of the Ballincor near field positioned between them.

8.11.2 The permitted developments: one dismissed in a paragraph, one ignored entirely

The chapter's own cumulative baseline (Section 12.3.8) lists two permitted developments. The first, Carrig (seven turbines, 6 km northwest, ABP-318689-23), the chapter itself identifies as presenting "*the greatest potential for cumulative effects from intervisibility*" of any development in the study area. It then disposes of its own concession in a single paragraph of assertion: Carrig will be "*a distant background feature*," or Ballincor will be, or the two will be seen "*in opposite viewing directions*." On that basis the global cumulative magnitude of "Low" is declared, without the reasoned narrative LITGN-2024-01 requires. The reasoning is compounded by its central premise: "*opposite viewing directions*" is offered as mitigation when, for a resident between the developments, it describes encirclement, turbines to the front and to the rear, the most severe cumulative condition, not the least. A second permitted development in the chapter's own baseline — Cush, eight turbines, 10 km north — receives no narrative assessment whatever. It appears in the baseline list and on Figure 12.12, and is never mentioned again.

8.11.3 The dismissal of the cumulative ZTV is self-serving and unevidenced

The chapter's stated ground for discounting its own Figure 12.12 — "*relatively limited intervisibility with the nearby Lacka Wind Farm*" apparent from the photomontage set, depends on the very photomontage set whose viewpoint placement and seasonal timing are critiqued at B3. A bare-ground ZTV overstates visibility in wooded or built terrain; in an open, flat, bowl-floor landscape of the kind the chapter itself describes, the divergence between theoretical and actual visibility is at its minimum. The Commission is invited to prefer the map to the commentary.

8.11.4 The WEDG cumulative test for this landscape type is failed on the chapter's own classification

Having classified the landscape as Flat Peatland, the chapter was required to apply the WEDG's cumulative guidance for that type: "*development should not be perceived to crowd and dominate the flat landscape*". The committed future baseline is thirty-four turbines across four schemes — eleven proposed at Ballincor, eight operational at Lacka, seven permitted at Carrig and eight permitted at Cush — before counting the twenty-eight operational turbines at Derrinlough and Cloghan in the northern study area. Thirty-four turbines within and around a single visual envelope, the largest scheme among them arranged as a horizon-filling linear string, is crowding and domination by any ordinary meaning of those words. The chapter does not conduct this test.

8.12 Conclusion

The failures identified in Part B of this report are of three kinds, and they compound.

The first is **misstatement**. The chapter asserts that the site lies within the Moderate and Low Sensitivity classifications of the adopted county mapping; the adopted map shows otherwise. An assessment shown to have misdescribed a verifiable matter of public record at its foundation — and to have argued, contrary to its duty of impartiality, for the discounting of the statutory designations it found inconvenient — cannot ask the Commission to rely on its professional judgement in matters less easily checked.

The second is **suppression**. Every discretionary judgement in Table 12.7 was resolved downward: sensitivity ratings that cannot be derived from the chapter's own criteria; magnitude ratings sitting below the chapter's own definitions of the scenes they describe; quality findings that contradict the chapter's own stated default; Moderate findings exempted from the justification LITGN-2024-01 requires; and a 35-year duration recorded in every cell and weighed in none. Correcting any one of these — most decisively the sensitivity input — carries the near-field viewpoints across the chapter's own significance threshold.

The third is **omission**. The assessment contains no viewpoint within the two largest receptor clusters; no meaningful assessment of Birr and none at all of Shinrone or Riverstown; no winter photomontage; no night-time visualisation or receptor-level lighting assessment behind its one-paragraph treatment of aviation lighting; no reverse-ZTV or other evidence that sensitive near-field locations informed the design; no receptor-level distance, elevation or cumulative analysis of the 312 surrounding dwellings; no substantive assessment of the permitted Carrig development it concedes presents the greatest cumulative risk, and none whatever of the permitted Cush development; and no application of the WEDG cumulative test for its own claimed landscape type.

Each failure is independently material. Taken together, they describe an assessment constructed to be incapable of finding a significant effect: distant viewpoints, summer photography, suppressed inputs, an inert treatment of duration, and a cumulative analysis that discounts its own evidence. The conclusion "Not Significant" is the product of these choices, not of the landscape — and the Commission is invited to attach weight to it accordingly. The assessment the applicant did not carry out — near-field, receptor-based, and cumulative at the level of the individual dwelling — is presented at Part C.

PART C - The Development as the Community Will Experience It

Part A established the landscape the assessment must answer to: a settled, inhabited, low-lying valley overlooked on every side by rising ground and by the towns of Birr, villages of Shinrone, Riverstown and Carrig, in which effective screening of an eleven-turbine, 180-metre array is not feasible. Part B demonstrated that the applicant's conclusion of "Not Significant" is not a finding the evidence produces, but the product of the choices made in reaching it — the understatement of residential sensitivity, the reliance on seasonal screening, *and above all the assessment of visual effect at twenty-seven selected viewpoints in a landscape where the resident population is far larger and far closer than that sample conveys.*

Part C of the report answers the question those choices left unanswered. Of the 312 dwellings identified within the study area, 206 — two-thirds — lie within 2 km of the nearest proposed turbine, and 50 lie within 1 km. A residential community of that size and proximity is represented, in the applicant's assessment, by a handful of viewpoints, most of them at distance. Part C removes that filter. It assesses every one of the 312 dwellings directly, on its own measured distance to the nearest turbine and its own count of turbines in view, and it classifies each one on the applicant's own significance scale. (See Appendix 8-4 for all the detail)

The purpose is twofold. First, it supplies the near-field residential assessment that the Wind Energy Development Guidelines 2006 and GLVIA3 require, proportionate to the population actually exposed to the development — the assessment Chapter 12 does not contain. Second, it tests whether the applicant's central conclusion survives the application of the applicant's own method to the full receptor population rather than a sample. It does not. The finding, set out below, is that significant residential visual effect is the norm across this community, not the exception.

NOTE: Part C is partnered by 2 key Appendices that do all the work Appendix 8-1 and Appendix 8-4. The Inspector is invited to review both in advance of Part C

Appendix 8-1: Receptor Assessment Software and Method This appendix is the audit layer of the receptor-level assessment. It sets out in full the method, master data and cluster-by-cluster analysis including associated VP images that are summarised in Part C. All 21 VP clusters are represented individually by image and cluster analysis in this document. Every figure cited in Part C can be traced to the underlying dataset in the project workbook. It is organised in three parts: the assessment method, the aggregate findings/master cluster table and the twenty-one standardised cluster sheets, presented in order of dwelling count.

Appendix 8-4 — Dataset by Receptor (Part C)

This is the full auditable receptor-level dataset underpinning Part C — every one of the 312 dwellings assessed individually, the methodological response to RWE's reliance on selected viewpoints. For each receptor it records: receptor ID, distance to nearest turbine, nearest turbine, assigned VP cluster, distance to that VP, turbines visible from each of the three developments (Ballincor / Lacka / Carrig), combined total, and the resulting significance classification on both the **Ballincor-only** and **cumulative** twin-classification basis.

8.13 How Every Dwelling Was Assessed – The Methodology

The detailed framework — the magnitude bands, the distance modifier, the significance matrix and the cluster sheets are presented in full in Appendix 8-3. Every per-dwelling rating can be traced back to the dataset in Appendix 8-4. What follows here is a summary of how the dataset was built and how each dwelling was classified.

8.13.1 The dataset

The assessment rests on a structured dataset of all 312 residential receptors within the study area, compiled from the application's own coordinate data, from the Zone of Theoretical Visibility analysis and on-site verification described in Part A. For each dwelling the dataset records its grid position; its distance to the nearest proposed turbine, measured to the individual turbine and taken from the application's own Appendix 5-1 coordinates. Turbine by turbine, for all eleven proposed Ballincor turbines an assessment of visibility was recorded. The same exercise records visibility of the operational Lacka and permitted Carrig turbines, enabling a combined cumulative count, of twenty-six turbines in total, to be held for every dwelling.

The 312 dwellings are organised into 21 clusters, each assigned to its nearest vantage point and to the photomontage/image taken from that position. See colour coded clusters below.

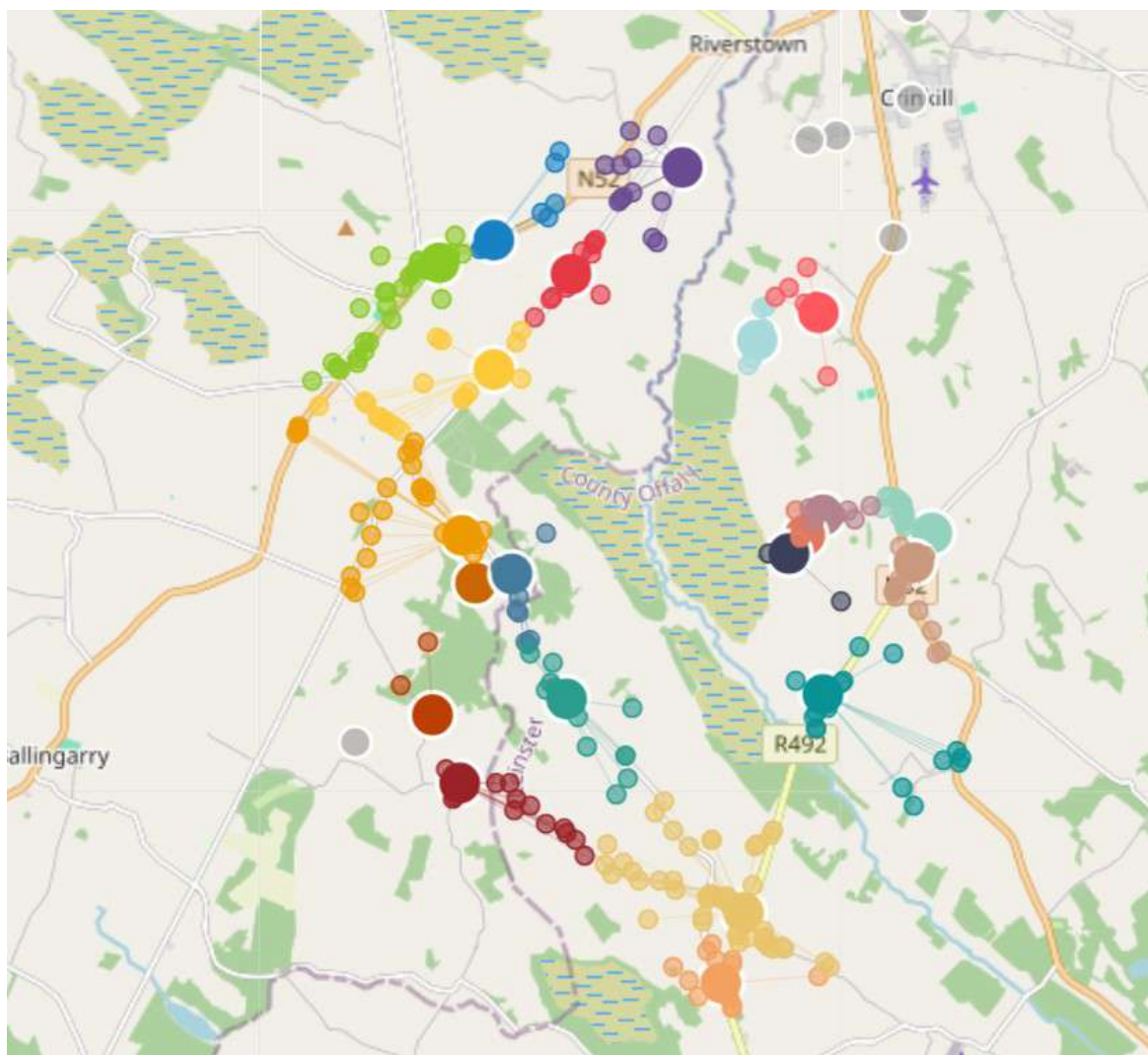


Figure 8-46

Clustering is a device for reporting and illustration, not a simplification of the data: every dwelling is assessed individually on its own turbine count and its own distance (See Appendix 8-4), and the cluster is simply the unit at which the results are presented. The progression from raw data to classification is fixed and reproducible, which means the rating of any dwelling can be checked directly by an Inspector against the dataset. There is no hidden weighting and no discretionary adjustment.

8.13.2 Receptor sensitivity: High, and why

Under GLVIA3, the sensitivity of a visual receptor is a function of who experiences the view. Residents at home are expressly among the most susceptible of all receptor groups, because their exposure is involuntary, sustained, and bound up with the amenity of the dwelling itself. Part B demonstrated that Chapter 12's assignment of "Medium-low" sensitivity to near-field residential viewpoints cannot be derived from the chapter's own stated criteria, and that

correcting that single input carries several of the applicant's own viewpoints across the significance threshold. Part C applies that correction throughout: every receptor here is a dwelling, so sensitivity is fixed at High. This is not an assumption adopted for convenience; it is the correct characterisation of a population composed entirely of residential receptors, in a landscape the adopted county mapping classifies as Moderate to High sensitivity, and it is the characterisation the applicant's own criteria produce when properly applied.

8.13.3 Two assessments, kept separate

Part C produces two distinct significance ratings for every dwelling and keeps them apart throughout. The first assesses the visual effect of the proposed Ballincor development on its own. The second assesses the cumulative effect of Ballincor together with the operational Lacka and permitted Carrig turbines. They are reported as two figures, never blended into one. This mirrors the structure of the applicant's own chapter, which assesses the proposed development first and treats cumulative effect separately, and it is deliberate. A single combined rating would invite the objection that the effect of the proposed development had been inflated by importing the neighbouring wind farms. Keeping the two apart makes each finding clean: the Ballincor-only rating answers the applicant's project assessment directly, turbine for turbine, on the applicant's own scale; the cumulative rating answers the inadequacy of the cumulative chapter identified in Part B. Two independently defensible findings are stronger than one composite that is not.

8.13.4 How magnitude and significance were determined

For each dwelling, the magnitude of visual change is assessed from two observable quantities: the number of turbines visible — the primary variable, because it determines how much of the field of view the development occupies — and the dwelling's distance to the nearest turbine, which acts as a secondary modifier. The turbine count is mapped onto a magnitude tier using the magnitude definitions stated in Chapter 12 itself, under which a proposal that obstructs a significant proportion of the vista and substantially alters the scene is of High magnitude. A dwelling with eight or more of the eleven turbines in open view plainly meets that definition. Distance then modifies that count-based tier by at most one step in either direction: dwellings within 1 km of the nearest turbine are raised one tier, reflecting near-field dominance; dwellings beyond 2 km are lowered one tier, as separation begins to temper the effect; dwellings between 1 and 2 km are unadjusted. Distance is treated as a modifier rather than a driver because the turbine count is recorded turbine-by-turbine and is not open to dispute, whereas distance, although measured precisely by the Applicant, varies across a narrow band

in which every dwelling is comparatively close. Allowing count to lead and distance to adjust reflects the true weight of the two variables.

Magnitude is then combined with the fixed High sensitivity through the significance matrix at Chapter 12, Table 12.4 — the same matrix from which every significance finding in the applicant's assessment is derived — to return a rating on the applicant's own scale: Imperceptible, Slight, Moderate, Substantial, Profound, with Substantial and above treated as significant in EIA terms. This is the methodological core of Part C.

The cumulative assessment applies the identical method, changing only the count input to the combined twenty-six-turbine figure, with the count bands scaled proportionately so the same magnitude tiers apply on a like-for-like basis.

One discipline follows from adopting the applicant's scale. Part B criticised the Applicant's Chapter 12 for returning "Moderate" findings without the explicit justification that the 2024 guidance update requires for effects in the middle of the range. Part C does not make that mistake: any dwelling classified at Moderate, in either assessment, is accompanied by an explicit statement of whether the effect is considered significant and why. Finally, elevation is treated as an aggravating factor and never as a discount. Part A established that the majority of dwellings sit at or above the level at which the lowest point of the rotor sweep passes, and that elevated receptors see more of a turbine, not less; no dwelling's magnitude has been increased for absence of screening or reduced on an assumption of intervening screening.

8.14 What the Assessment Found

Appendix 8-1 and Appendix 8-4 provide all the data to support this analysis..

8.14.1 The headline finding

On the proposed development considered alone

- 276 of the 312 dwellings — 88 per cent — experience a visual effect of Substantial significance or greater, the threshold at and above which an effect is significant in EIA terms on the applicant's own scale.
- Of these, 120 dwellings reach the highest rating of Profound-Substantial and a further 120 reach Substantial.
- On the cumulative assessment, taking Ballincor together with the operational Lacka and permitted Carrig turbines, 286 of the 312 dwellings — 92 per cent — experience a significant effect.

This stands directly against the conclusion of the Applicant's Chapter 12, which identifies no significant residential visual effect anywhere in the study area. The divergence is not a matter of differing professional judgement at the margins. It is the difference between assessing twenty-seven selected viewpoints and assessing all 312 dwellings, using the same significance matrix in both cases. When the applicant's own method is applied to the whole receptor population rather than a sample, the great majority of dwellings record significant effects.

There is a modest gap between two key figures — 88 per cent faced significant effects on the proposed development alone, rising to 92 per cent facing significant effects on the cumulative effect of 3 windarms. This is itself instructive. It demonstrates that the significant effects identified are driven overwhelmingly by the proposed Ballincor development in its own right, not by the pre-existing presence of the neighbouring wind farms. The proposed development does not add marginally to an already-saturated baseline; it is the principal cause of significant visual effect at the great majority of these homes.

8.14.2 How much of the wind farm is in view

The number of turbines visible from a dwelling is the primary determinant of magnitude, and its distribution across the 312 receptors is heavily weighted towards high visibility. A majority of dwellings see eight or more of the eleven proposed turbines; sixty-one see all eleven; and only twenty see none at all. The modal experience is not a glimpsed or partial view but a substantial proportion of the entire wind farm in simultaneous view.

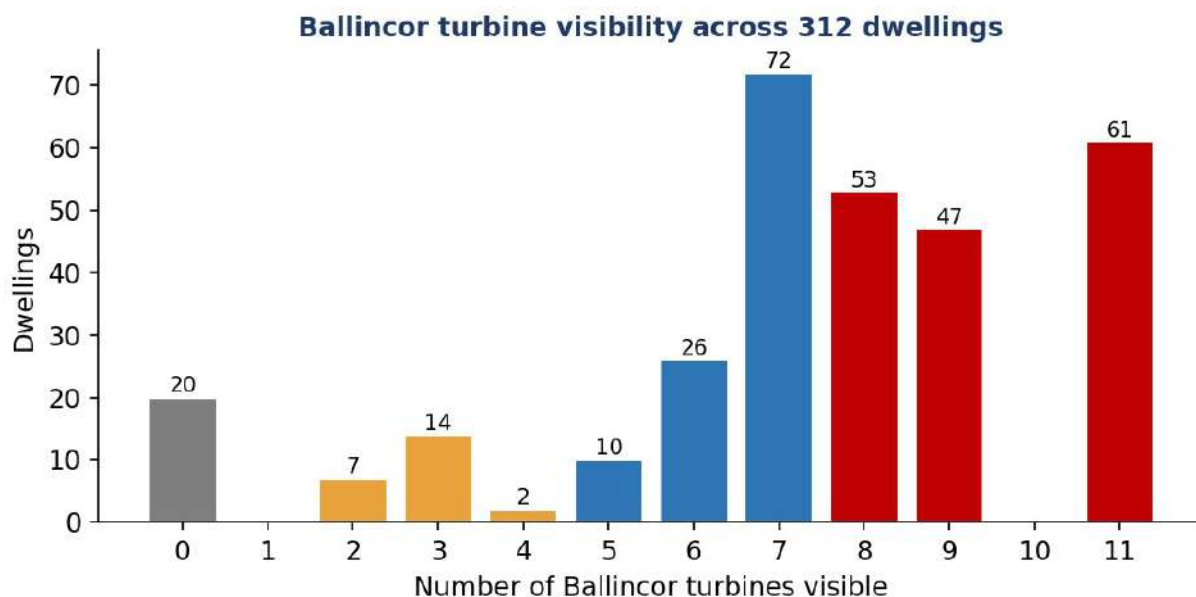


Figure 8-47: *Number of Ballincor turbines visible across the 312 dwellings. The distribution is weighted to the right: most dwellings see a majority of the eleven turbines, and the single most common count is seven.*

This distribution is the single most important corrective to Chapter 12. A viewpoint-based assessment can select locations where intervening landform or vegetation limits the count; the receptor population as a whole cannot be so selected, and when assessed in full it shows that high simultaneous turbine visibility is the norm, not the exception, among the dwellings that surround the site.

8.14.3 How close the community lives

Distance to the nearest turbine, taken from the application's own coordinates, confirms the near-field concentration of the receptor population. Fifty dwellings lie within 1 km of the nearest turbine, two-thirds lie within 2 km, and every one of the 312 dwellings lies within 2.5 km. There is no remote tail to this population: it is, in its entirety, a near-field residential community.

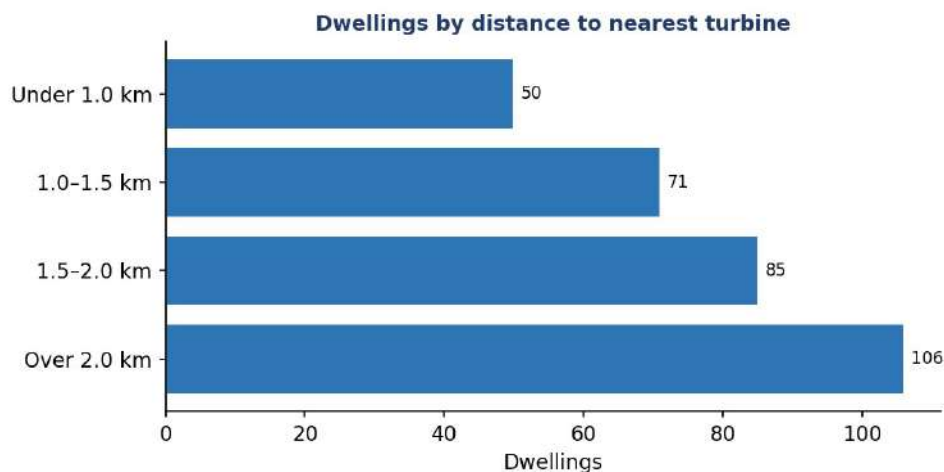


Figure C.2 — **Figure 8-**

48: *Dwellings by distance to the nearest proposed turbine. The entire population lies within 2.5 km; none is remote from the development.*

This is the spatial fact that the viewpoint selection in Chapter 12 does not convey. A residential community in which two-thirds of dwellings lie within 2 km of a 180-metre turbine is one in which significant visual effect is, on any orthodox application of the guidance, the expected outcome — and that is precisely what the assessment returns.

8.14.4 The significance distribution, on both assessments

The significance findings for both assessments are shown below. In each, the great majority of the population falls at or above the significance threshold, and the two distributions differ only modestly — the cumulative assessment shifting a further tranche of dwellings upward, as the combined turbine context would predict. In neither does the population resemble the 'not significant' picture presented in Chapter 12. The dwellings recording 'no significant effect' are a small minority — those screened by landform or sufficiently distant that the turbine count falls away — and they are the exception that the viewpoint-based assessment has, in effect, generalised to the whole.

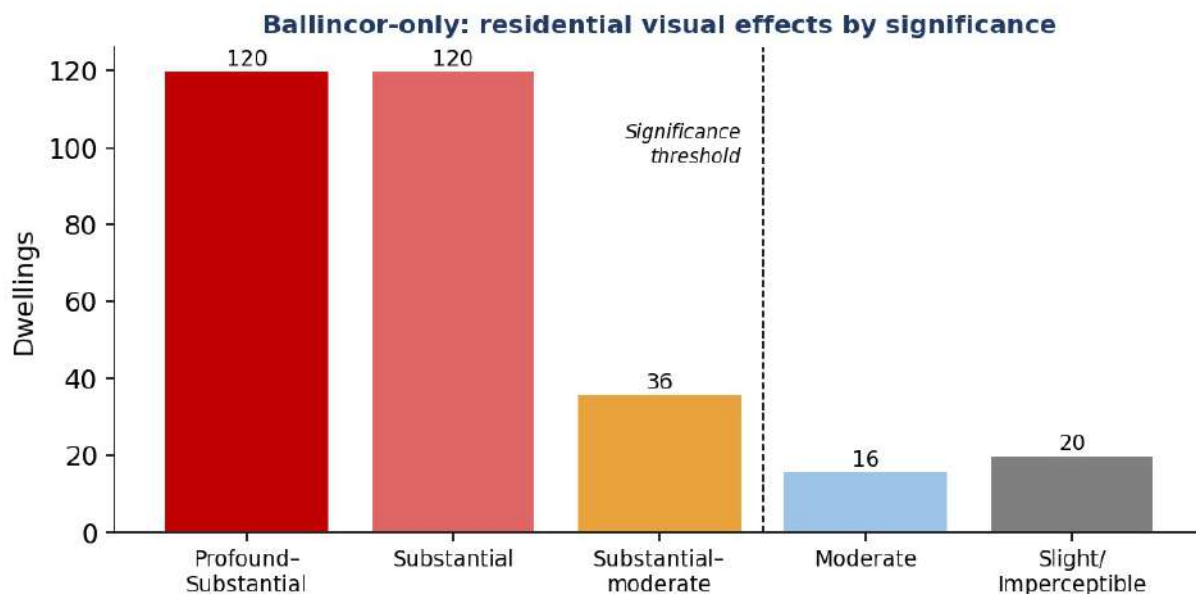


Figure 8-48:— Ballincor-only significance distribution: 120 Profound-Substantial, 120 Substantial, 36 Substantial-moderate, 16 Moderate, 20 Slight/Imperceptible. 276 of 312 dwellings (88%) lie at or above the significance threshold.

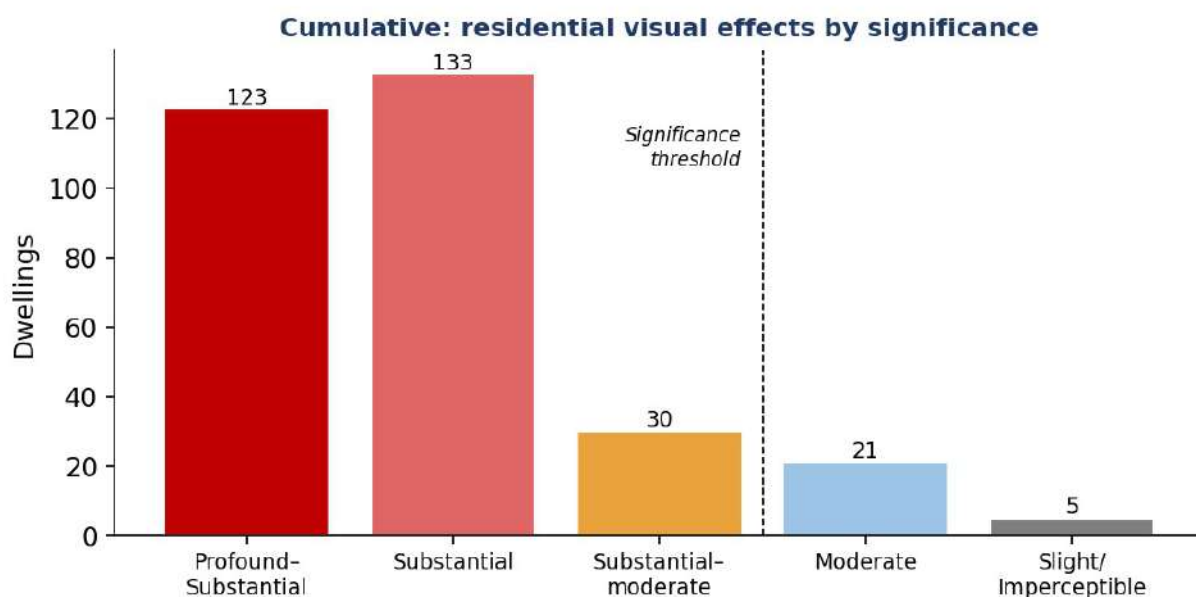


Figure 8-49: Cumulative significance distribution: 123 Profound-Substantial, 133 Substantial, 30 Substantial-moderate, 21 Moderate, 5 Slight/Imperceptible. 286 of 312 dwellings (92%) lie at or above the significance threshold.

8.15 The Pattern Across the Landscape

The aggregate figures are borne out, dwelling by dwelling, across the twenty-one clusters. The full per-cluster analysis — each cluster's photomontage, data, both ratings and commentary — is set out in Appendix 8-1; what follows draws out the pattern that analysis reveals. Four features of it bear directly on the applicant's conclusion.

8.15.1 The most exposed: the near-field clusters

The dwellings closest to the development record the most severe effects, and they record them uniformly. At Pallas and Cahorleigh, off the L1071 to the north, all seventeen dwellings hold nine of the eleven turbines in view at between 0.80 and 1.34 km, and every one is classified at Profound–Substantial — the only cluster of its size in which the entire population reaches the top of the applicant's scale on the proposed development alone. At Ballimanoe and Cloonheed Lanes, the closest cluster in the study area, all eight dwellings lie within 1 km of the nearest turbine, the nearest at just 0.56 km, and all eight are Profound–Substantial. At Cronekill, nineteen dwellings see nine turbines from as close as 0.76 km, eighteen of them at Profound–Substantial. These are not marginal or contestable judgements; nine or more turbines in open view at well under 1.5 km is the direct output of the magnitude definitions Chapter 12 itself sets out. The applicant's assessment carries no viewpoint at a comparable separation, and so the most proximate residential effects in the entire study area are absent from it.

8.15.2 The most populous: where the largest numbers are affected

The significance findings are not an artefact of small outlying groups. The three largest clusters all record significant effect across the great majority of their dwellings. The single most populous cluster, fifty-five dwellings strung along the Galbally Road to the east, holds a consistent seven turbines in view; all fifty-five are assessed at Substantial–moderate or greater, and fifty-three at Substantial or above. The thirty-seven dwellings near Carrig village on the N52 hold eight turbines in view and are uniformly significant. The twenty-six dwellings at the Doorley cluster span the full range from no turbines to all eleven, with seventeen at Substantial or above. The effect therefore falls on the most populous receptor concentrations, not merely on isolated properties, and it does so in the very locations the applicant's viewpoint sample passes over.

8.15.3 A sustained band of effect along the N52 at Carrig

Two adjacent clusters on the N52 approach to Carrig village — thirty-seven dwellings at the church, ten more immediately outside the village — together record a continuous band of high residential visual effect, the latter at Profound–Substantial, along a national secondary road serving a settlement the adopted development plan seeks to protect. This bears directly on the County Development Plan dimension of the objection set out in Part B: significant residential effect at a protected settlement, on a busy approach road, that the applicant's assessment does not report.

8.15.4 Where the cumulative context tips the balance — and where the method finds no effect

The value of keeping the two assessments separate is shown where they diverge. At Tinnakilly and at Clonkelly Lane, clusters that sit at the lower significant tier on the proposed development alone rise by a full tier once the Lacka and Carrig turbines enter the view — the receptor-level evidence for the cumulative case that the applicant's cumulative chapter does not develop. The divergence runs in both directions: at the upper Rathbeg Lane cluster, part of the group eases on the cumulative figure as the distance modifier resolves the combined count, which is reported transparently rather than smoothed.

Equally important are the clusters where the method finds no significant effect. At the L8029/R492 junction, fourteen dwellings see only three turbines and the cluster sits, in the round, below the threshold; at Loughkeen, the only cluster from which no Ballincor turbine is visible at all, both dwellings are Slight–Imperceptible. These are reported as non-significant without qualification. Their inclusion matters: a method that returned significance everywhere would be open to the charge of being insensitive to genuine variation. That two clusters fall below the threshold demonstrates that the framework discriminates on actual exposure and gives the eighty-eight and ninety-two per cent findings their force.

8.16 What This Means for the Applicant's "Not Significant"

The applicant's conclusion of no significant residential visual effect rests on the assessment of a small and largely distant sample of viewpoints. When the applicant's own method — the same sensitivity properly applied, the same magnitude definitions, the same significance matrix — is applied instead to every one of the 312 dwellings on its own measured exposure, the conclusion does not hold. Significant effect is recorded at 88 per cent of dwellings on the proposed development alone and 92 per cent cumulatively. The dwellings most directly exposed, and the most populous concentrations of homes, are precisely those the viewpoint sample does not represent.

The mechanism by which the applicant reached "Not Significant" is therefore identifiable: it is the generalisation, to a whole near-field residential community, of the limited effect recorded at a sample weighted towards distance and open ground. Part C does not rest on a competing methodology or a contested matter of opinion that an inspector would have to choose between. It rests on the applicant's own framework, applied without the selection that produced the applicant's result. On that basis the proposed development gives rise to significant residential visual effects across the great majority of the surrounding community, and the assessment in Chapter 12 cannot be relied upon to conclude otherwise.

APPENDIX 6: Roads, Transport and Traffic

CHAPTER 10: Roads, Traffic and Transportation

10.0 Introduction

This chapter is a direct, evidence-based objection to the Roads, Traffic and Transportation assessment presented in Chapter 14 of the Applicant's Environmental Impact Assessment Report (EIAR), read together with its supporting appendices: the Stage 1/2 Road Safety Audit (Appendix 14-1), the IDASO traffic counts (Appendix 14-2) and the Traffic Management Plan (Appendix 2-2).

The community's central submission is a simple one: the Applicant's own documents do not support the conclusions the Applicant draws from them. This objection is built on the Applicant's own survey data and its own consultants' reports. The grounds that follow repeatedly identify points at which Chapter 14 reaches a reassuring conclusion that its own appendices contradict.

Three features of the assessment run through this objection as a whole. **First**, the assessment relies on smoothed averages and percentage-increase metrics that mask the acute, concentrated reality of the works — averaging heavy-vehicle deliveries across a working week, expressing surges as small percentages of a low baseline, and so presenting an intense industrial undertaking as a series of minor, transient effects. **Second**, the documents are internally inconsistent: Chapter 14, the Traffic Management Plan and the Road Safety Audit disagree with one another on matters as fundamental as the available visibility splay, the volume of construction traffic, and the construction programme itself. **Third**, the evidence base is thinner than the firm conclusions drawn from it — a single-day junction count, an automatic count cut short by equipment failure, and a single survey season are made to bear conclusions of "ample capacity" and effects that are "imperceptible / not significant."

Against that backdrop, the introduction of intensive heavy civil-engineering works, an underground grid connection trenched over 12.23 km across two county jurisdictions, heavily concentrated traffic surges during the foundation concrete pours, and large Abnormal Indivisible Load (AIL) turbine-delivery configurations, will cause significant disruption, pose real safety hazards to local residents, and place severe strain on the rural road network this community depends upon for daily life, school transport, employment and agricultural operations.

The grounds of objection are set out below, ordered broadly from the most safety-critical and most clearly evidenced to the supporting and cumulative concerns. They begin with the Applicant's own measured speed data and the contradiction it exposes in the visibility-splay case (§10.1–§10.2); proceed through the deficiencies of the Road Safety Audit and the

unreliability of the underlying survey data (§10.3–§10.4); address the underestimation of construction and concrete-pour traffic, the Blackbull junction, the condition of the haul roads, and the grid-connection trenching (§10.5–§10.10); and conclude with the characterisation of residual effects, the threats to heritage structures and the abnormal-load route, the cumulative impact of concurrent infrastructure projects, and the community's rejection of the Applicant's overall "not significant" conclusion (§10.11–§10.15). Where the objection relies on community field observation rather than on the Applicant's documents, that is stated expressly, so that the Commission may weigh each point on its proper footing.

10.1 The Applicant's Own Speed Data Demonstrates a Severe, Unaddressed Safety Risk — rewritten in full

This is the single most important issue in the assessment and it is established entirely by the Applicant's own survey data. The Automatic Traffic Count (ATC) survey commissioned by the Applicant and reproduced at Appendix 14-2 records actual measured vehicle speeds on both access roads. Those measured speeds substantially exceed the posted limits and are flatly inconsistent with the visibility and stopping-sight-distance claims made in Chapter 14.

Road	Posted speed limit	Cumulative 85th-percentile speed	Maximum recorded speed
R492 / ATC 1	80 km/h	94.4 km/h	137.7 km/h
L1071 / ATC 2	60 km/h	89.5 km/h	131.3 km/h

Source: Appendix 14-2 (IDASO ATC survey, May 2024), cumulative speed-survey summaries.

The 85th-percentile speed is the standard design parameter used to set required visibility and stopping sight distances under TII DN-GEO-03060. On the R492, the measured 85th-percentile speed of 94.4 km/h is 18% above the posted 80 km/h limit, and the recorded maximum of 137.7 km/h is almost 72% above it. On the L1071, the measured 85th-percentile speed of 89.5 km/h is approximately 49% above the posted 60 km/h limit.

This is decisive for three reasons.

- First, it confirms the community's field observation (previously dismissible as anecdotal) that real-world speeds on these roads regularly reach or exceed 90–100 km/h.
- Second, the Applicant's own Road Safety Audit independently flagged exactly this problem (Appendix 14-1, S4.1.1: "site observations suggest the vehicle speeds might be in excess of these speed limits").
- Third, the visibility splays must be designed for the speeds vehicles *actually* travel, not the speeds posted — and on the measured 85th-percentile speeds, the splays the Applicant's own auditors recorded (160 m and 90 m; see S10.9) fall short of the required stopping sight distance.

Critically, the R492 speed data is the only part of that survey the Applicant could rely upon, and even that survey is incomplete. Every page of the R492 count carries the note: *"No data after 16:00 22/05/2024 as tubes were damaged."* The R492 ATC therefore captured only seven full days, the final day is partial, and the survey failed to record the Wednesday evening (PM) peak at all — the very peak period the assessment treats as the worst-case scenario. The Applicant draws firm conclusions about R492 capacity and safety from a dataset its own equipment failed to complete.

The Applicant's proposed mitigation, a "temporary advisory speed limit" that the TMP expressly states it does not propose to signpost to general traffic (TMP S5.6.2), will have no effect whatsoever on the public traffic that the ATC data shows is travelling at these speeds. An unsigned advisory limit binding only the developer's own contractors cannot mitigate a hazard created by the speed of *other* road users.

10.2 Technical Flaws and Internal Contradiction in the Claimed Visibility Splays

The Applicant relies on compliance with TII DN-GEO-03060 (Geometric Design of Junctions) to claim that the primary access junctions can "safely accommodate" both standard heavy transport and Abnormal Indivisible Loads (AILs). That claim does not survive examination of the Applicant's own documents, which state three different visibility figures for the same junction.

The visibility splay (the "y-distance") is the foundation of any junction safety case, and the three documents submitted in this application cannot agree on what it is:

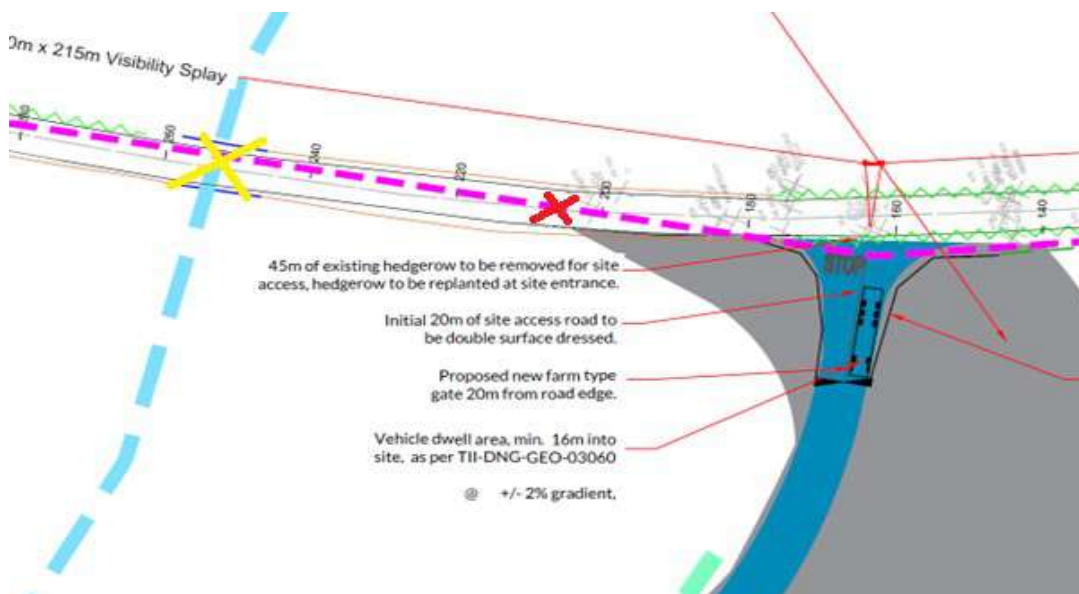
- Chapter 14 (S14.9.1.3) asserts a **215 m** y-distance on the R492 and states that sightlines accord with TII DN-GEO-03060 and the Offaly County Development Plan.
- The Applicant's own Stage 1/2 Road Safety Audit (Appendix 14-1, S4.1.1) records the available splays as only **160 m on the R491/R492 and 90 m on the L1071** — not 215 m.
- The Applicant's own Traffic Management Plan (Appendix 2-2, S5.4) likewise states the requirement as **160 m** (citing the Offaly CDP), and records vertical visibility of only 165 m achievable to the right.

There is therefore an unexplained **55 m discrepancy** between the figure relied upon in the impact assessment (215 m) and the figure the Applicant's own consultants actually measured

and recorded (160 m). The 215 m on which the entire "safe accommodation" conclusion rests is not supported by the Applicants own Road Safety Audit or the Traffic Management Plan.

Of greatest concern to the community is that even the disputed 215 m would be marginal against the measured speeds; the recorded 160 m is plainly inadequate. As set out above, the Applicant's ATC survey (Appendix 14-2) records a cumulative 85th-percentile speed of **94.4 km/h on the R492** — 18% above the posted 80 km/h limit, with a maximum recorded speed of 137.7 km/h. The stopping sight distance required under TII standards for that measured speed is materially greater than 160 m. The splay the auditors actually recorded therefore falls short of the requirement for the speeds vehicles are genuinely travelling — precisely the hazard the auditors themselves flagged at Appendix 14-1, S4.1.1 ("development traffic may exit into the path of unsighted public road vehicles").

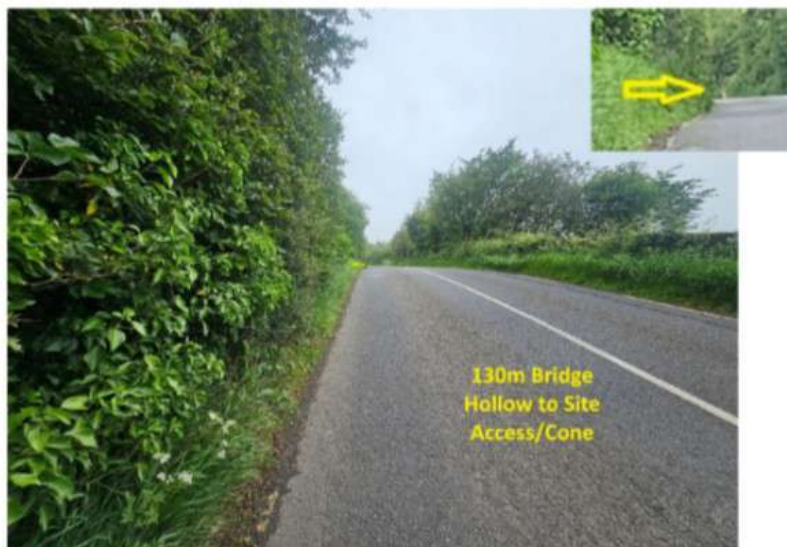
The Applicant further asserts a 3 m 'x-distance' setback. On a live, unlit, high-speed regional road, a 3 m setback requires the cab of a standard heavy vehicle or the far longer nose of an AIL transporter to sit dangerously close to the carriageway before the driver can achieve any forward sightline at all. Read together with the micro-topography of the R492 (mature roadside hedgerows and severe vertical and horizontal crests), the theoretical splay is not achievable in practice.



The image above suggests a straight line view from the access point/site entrance to the yellow cross. In fact a clear line of sight extends only to the Red X.. From the site entrance the yellow X is around the bend, on the crest of the bridge with a hollow beyond it – there is no clear line of visibility to this point.

These conditions are borne out by direct field measurements and empirical observations compiled by the local community, which reveal severe, unaddressed spatial hazards on the R492 **within a critical 150 m envelope** on the Sharavogue side of the entrance. The following measurements are community-sourced field observations and are advanced to demonstrate that the local topography reduces real-world visibility well below even the disputed splay figures:

- As a driver approaches the site access from the Sharavogue direction, the undulating road topography cuts off any view of the entrance. Owing to a sharp bend, a structural hollow and two historic bridges, the first point of any theoretical visibility occurs at a mere **130 m**, as the vehicle crests the bridge. Safe, dependable and reliable visibility does not present until an unacceptably short **90 m** from the junction interface.



- Looking out from the proposed site access back toward Sharavogue, the micro-topography creates a dangerous blind zone. A vehicle travelling from the Sharavogue direction becomes entirely submerged and invisible in the road hollow at a distance of **125 m**, and re-emerges into the line of sight of an exiting heavy vehicle only at a critically compressed **115 m**.



While the posted speed limit on this section of the R492 is 80 km/h, the Applicant's own survey data (Appendix 14-2) confirms that real-world speeds regularly approach and exceed 100 km/h. At these speeds, when driver perception-reaction time and heavy-vehicle braking coefficients on a non-flat, un-engineered rural surface are taken into account, the real-world visibility window of 115 m to 130 m falls drastically short of safe stopping sight distances. Forcing slow-moving, multi-axle HGVs or wind-turbine transporters to pull out onto a high-speed regional route from an access blinded by a physical hollow is, in the community's submission, a serious road-safety hazard.

Finally, the Applicant's reliance on swept-path analysis demonstrates geometric possibility, not operational safety. The claim that Autotrack or swept-path analysis (Appendix 2-1) "demonstrates that the junction can safely accommodate wheel tracks" presents an idealised scenario. A 16.5 m legal articulated vehicle — still more a specialised multi-axle turbine-blade

transporter — executing a tight turn from a narrow, un-engineered rural road body will generate extreme tail-swing and front over-sail. Even where the *wheels* remain on the structural pavement, the body and cargo will sweep over the opposing road boundary, forcing oncoming traffic to make emergency stops on a route where, on the Applicant's own data, vehicles travel at an 85th-percentile speed of 94.4 km/h and visibility is readily compromised by weather and seasonal glare. The simulation proves the manoeuvre is geometrically possible; it does not prove it is safe.

10.3 Hidden Hazards Dismissed by the Stage 1 Road Safety Audit (RSA)

The Applicant states (Chapter 14, S14.12) that a Road Safety Audit was carried out for the R492 (southern) and L1071 (northern) access junctions, and that its recommendations "have been incorporated into the scheme design." An examination of the audit itself (Appendix 14-1) shows that this reassurance does not withstand scrutiny.

10.3.1 The audit is preliminary, brief, and conducted in benign conditions

The audit is a Stage 1/2 audit (Appendix 14-1, cover and S1.1) — not a final, construction-stage audit. ▯ The audit "process" ran **between 24–28 October 2025** (S1.2) but the actual site inspection lasted 45 minutes (11:30–12:15 on 25 October 2025), in conditions the auditors themselves record as "fine," with a "dry" road surface and traffic "considered light with cars and light goods vehicles only" (S1.4). The audit therefore tested none of the operational realities — dust, seasonal glare, severe weather, or the presence of heavy vehicles — on which the community's safety concerns rest.

The auditors themselves recommend a further audit. At S1.6 the audit team records that detailed design elements (levels, gradients, surfacing, lighting, signs) were not provided, and expressly states that "it is therefore recommended a further road safety audit of the full design is undertaken prior to commencing the construction of this scheme." The Applicant's own auditors thus regard the Stage 1/2 audit as an insufficient basis on which to commence construction.

10.3.2 The "incorporated into the scheme design" claim is unevidenced

Chapter 14 states the audit recommendations were "incorporated into the scheme design." However, the audit's own Designer Response / Feedback Form (Appendix 14-1, Appendix B) is **blank**. There is no signed Designer Response accepting, rejecting or proposing alternatives to any recommendation, and no Audit Team confirmation that any response was accepted. The procedural step that would evidence "incorporation" has not been completed. The claim is therefore unsupported on the face of the Applicant's own documents.

10.3.3 The audit raises unresolved safety problems

Far from clearing the scheme, the audit (S4) records the following problems, each of which the audit team certifies (S1.8) "require action in order to improve the safety of the scheme and minimise collision occurrence":

- **Junction visibility / speed (S4.1.1):** the splays are recorded as "160 m for the R491 and 90 m for the L1071," and the auditors note that "site observations suggest the vehicle speeds might be in excess of these speed limits." Development traffic "may exit into the path of unsighted public road vehicles."
- **Forward visibility (S4.1.3):** forward visibility for R491 southbound drivers to a vehicle waiting to turn right may be "restricted by roadside hedging," with a risk of "rear-end shunts."
- **Junction radii (S4.2.1):** the operational-phase junction radii "appear large," with a risk that traffic "may exit left off the R491 at high speeds and lose vehicle control," and that turning drivers may be unable to see smaller approaching vehicles such as two-wheelers.
- **Livestock (S4.1.2) and L1071 conflicts (S4.2.2):** absence of fencing/gates raises a risk of livestock straying onto the public road; and at the L1071 the proximity of the farm access raises a risk of vehicles becoming "stranded with the rear end protruding into the L1071 carriageway."

Road-numbering defect. The audit also records (S1.6) a material documentation error: the design drawings label the regional access road as the "**R491**" whereas the road is in fact the R492. The audit was conducted, and the junctions assessed, against drawings bearing the wrong road number. This casts doubt on the precision of the design information underpinning the access junction.

10.4 Unreliability of the Survey Evidence Base — new standalone ground

Beyond the specific findings in S10.2 and S10.8, the community objects to the reliability of the survey evidence on which the entire transport assessment is built. A traffic and transport assessment is only as sound as the baseline data underpinning it. On examination, the IDASO surveys at Appendix 14-2 are affected by data gaps, single-point sampling and seasonal limitations that the Applicant does not disclose or address in Chapter 14.

- The R492 automatic count is incomplete. As set out at S10.8, the R492 (ATC 1) count was terminated early by equipment failure: *"No data after 16:00 22/05/2024 as tubes were damaged"* (Appendix 14-2). The R492 — the road the Applicant designates to carry 100% of construction traffic (S14.3.3) — was therefore surveyed for only around seven full days, with the final day partial and the Wednesday PM peak missing. No re-survey was carried out to fill the gap.
- The Blackbull junction was counted on a single day. The classified turning count at the N62/R492 Crossroads — the principal assessment junction — was undertaken on one Thursday only (16 May 2024) (Appendix 14-2, Site 1). A single 12-hour weekday count provides no basis for assessing day-to-day variability, and none was undertaken.
- The surveys are single-season. Both counts were conducted in mid-to-late May 2024, a single non-representative window that falls outside both the main agricultural working peaks and the school-holiday troughs. There is no seasonal adjustment, and no acknowledgement that traffic and heavy-vehicle volumes on these rural roads vary materially across the year.
- The HGV baseline data is not used to express the true scale of impact. The survey data shows existing heavy-vehicle volumes that Chapter 14 never states in absolute terms: the R492 carries on average approximately 89 HGV movements per day (~6.8% of traffic) and the L1071 approximately 42 HGV movements per day (~8%), with weekday HGV proportions reaching 9–10% (Appendix 14-2, daily totals). Against the R492 baseline of ~89 HGV movements per day, the concrete-pour requirement of 186 two-way HV movements (S14.6.1.1) would roughly treble existing heavy-vehicle traffic on that road on each of the 10 pour days — an impact wholly obscured by the Applicant's "percentage increase against all traffic" presentation.

- The conclusions are disproportionate to the evidence. On the basis of one incomplete week on the R492, one Thursday at the junction, and a single survey season, the Applicant concludes that the junctions have "ample capacity," that detailed capacity modelling is unnecessary (S14.8.2.1), and that residual effects are "imperceptible / not significant" (S14.13). The community submits that these conclusions are not supported by an evidence base of this quality, and that — at minimum — the R492 count should be repeated in full, multi-day junction counts undertaken, and capacity modelling carried out, before any reliance is placed on the assessment's findings.

10.5 Severe Operational Strain and Underestimation of Peak Trip Generation

The community objects to the way Heavy Vehicle (HV) movements are presented in Chapter 14, S14.6.1, and to material inconsistencies between the EIAR and the TMP.

The Applicant states a "maximum of 27 daily HV one-way trips" at peak construction (S14.6.1, Table 14-4), i.e. **54 two-way HV movements per day**, over the July–September 2027 peak when site compounds, forest felling, drainage, internal road building, turbine hardstands and foundation steelwork occur simultaneously.

The figures are internally inconsistent. The TMP (Appendix 2-2, S4.4.2) states the scheme will generate "approximately 10 one-way HV movements per day on average," and (S4.4.3) "daily average 20 HGV 2-way movements" which is markedly different from the EIAR's 27 one-way / 54 two-way peak. The staff-trip assumptions also differ: the EIAR assumes one person per car (240 trips; S14.6.2) while the TMP assumes two persons per car (160 trips; S4.4.1). Two of the Applicant's own documents cannot agree on the volume of traffic the project will generate.

Finally the construction programme itself is inconsistent. The EIAR (S14.5.1) gives the Electrical/Grid phase as 18 months, turbine delivery as 12 months and commissioning as 4 months; the TMP (S4.1) gives the same phases as 9 months, 4 months and 2 months respectively. A transport assessment built on a programme that the Applicant cannot state consistently cannot be relied upon to demonstrate that peak overlaps have been correctly identified.

10.6 Unprecedented Concrete Pour Surges and Total Gridlock Risk

Chapter 14, S14.6.1.1 discloses a concentrated logistical surge during the turbine foundation concrete pours that presents a serious risk to local traffic and road safety.

The construction methodology requires each of the 11 No. turbine foundations to be completed as a continuous, single-day pour (S14.6.1.1). Each pour day requires **93 HVs to arrive on site — i.e. 186 two-way HV movements** — on the narrow local road network within a single working day (S14.6.1.1). The Applicant's own figure of an average of **9 HVs arriving per hour** (S14.6.1.1) equates to a heavy vehicle traversing the local roads approximately **every 6.6 minutes** throughout the working day, on each of the 10 pour days.

The proposed mitigation is inadequate and partly self-contradictory. The Applicant proposes only to limit "other" non-essential HVs on pour days (S14.6.1.1, S14.9.1). The TMP (S5.6.4) goes further and proposes "staggering the pouring of concrete on different days" and avoiding pours on days of large deliveries — an implicit acknowledgement that pour-day traffic is incompatible with normal operations. Neither measure addresses the existing agricultural and domestic traffic that must share these roads, nor the cumulative effect of a continuous convoy at this frequency on local farming operations during critical seasonal windows.

10.7 Dangerous Traffic Extensification and Bottlenecks at Blackbull (N62/R492 Crossroads)

The Applicant's assessment of the Blackbull junction, which the Applicant identifies as the "N62/R492 Crossroads Junction" and treats as the principal assessment junction (Site 1), understates the operational risk to this intersection, and rests on a survey basis too thin to support the conclusions drawn from it.

The junction is a **four-arm crossroads**, not a simple priority T-junction. The Applicant's own turning count (Appendix 14-2, Site 1) records four arms — Arm A (L4008), Arms B and D (N62), and Arm C (R492) — meaning every development vehicle turning between the N62 and the R492 must negotiate conflicting movements across a full crossroads. This geometry is materially more hazardous for slow-turning HGVs and multi-axle AIL configurations than the assessment acknowledges.

S14.3.3 (Table 14-1) records total approach flows of 685 vehicles (AM peak, 08:15–09:15) and 747 vehicles (PM peak, 17:00–18:00). The Applicant's own survey data discloses a further figure not carried into Chapter 14: a 15-minute peak of 202 vehicles between 17:15 and 17:30 (Appendix 14-2, Site 1 summary) equivalent to a flow rate of over 800 vehicles per hour at the sharpest point of the evening peak. The junction is therefore considerably busier at its true peak than the smoothed hourly figures suggest.

The classified turning count was undertaken on **one day only — Thursday 16 May 2024**, between 07:00 and 19:00 (Appendix 14-2, Site 1). There is no multi-day or multi-season validation. The Applicant nonetheless relies on this single Thursday count to conclude that the junction has "ample capacity" and that "further detailed junction capacity analysis is not considered necessary" (S14.8.2.1). No ARCADY/PICADY or equivalent capacity modelling has in fact been carried out, despite the chapter author listing that very software among her competencies (S14.1.1).

The percentage-increase methodology masks the problem rather than assessing it: a low background flow on a geometrically constrained four-arm crossroads does not establish that the junction can absorb slow-turning HGVs and AIL configurations turning between the high-speed N62 (100 km/h) and the narrow R492. The relevant question is conflict and queuing geometry, not percentage of a small base number. Because the R492 is narrow with poor alignment (S14.3.2.2), the community submits that slow-turning HGVs and AIL configurations exiting the N62 into the R492 will generate queuing on the national secondary route, affecting local commuters, agricultural machinery and school transport. The physical geometry of the Blackbull crossroads is not capable of safely filtering these combined movements. That question has not been assessed at all.



Black Bull towards Birr

Black Bull towards Roscrea



Black Bull towards Shinrone

10.8 - Mischaracterisation of "Legacy" Regional and Local Roads

The Applicant asserts (Chapter 14, S14.3.1.1) that the regional road R492 and local road L1071 are "generally in good condition" and (S14.3.2.2) suitable for HGVs. The community disputes this characterisation, which is contradicted by the Applicant's own description of the same roads.

- Having described the R492 as "generally in good condition," S14.3.2.2 then admits the R492 — the designated primary construction haul route — is "relatively narrow, with limited hard shoulders and several bends, typical of rural roads in the area." A road cannot simultaneously be "suitable" for prolonged industrial haulage and "relatively narrow" with "limited hard shoulders and several bends."
- These are historic, lightly-engineered rural roads lacking deep structural foundations. The Applicant provides no pavement core data, no structural (CBR or equivalent) testing, and no residual-life analysis to support the bare assertion that they are "suitable" for intense, prolonged construction haulage.
- The Applicant confirms (S14.3.3, S14.7.1) that **100% of construction traffic will be routed onto the R492**, with the L1071 access used for the operational phase only. The entire construction burden therefore falls on a single, admittedly narrow regional road. The community submits that this concentration will result in structural pavement failure, edge-breaking, and localised "water cuts" where trenching severs the road body.

10.9 Community Isolation and Grid Connection Route (GCR) Disruption

Section 8.2.4 reveals a massive, long-term impact that will severely isolate residents and disrupt daily transit.

- The proposed Grid Connection Route (GCR) spans 12.23 km, cutting through the border between County Tipperary (8.54 km) and County Offaly (3.66 km), with the vast majority situated inside our vulnerable public road network before running along 2.44 km of the busy R439 Birr–Banagher Road.
- The applicant admits that progress will be a painfully slow 250 meters per week, with up to 100 meters of trench left wide open at any given time. The figures demonstrate that trenching the public road network will drag on for nearly 50 weeks (almost a full year) of continuous local disruption.
- The applicant's casual acknowledgement that this "will require a temporary road closure of local roads and a temporary road closure of regional road R439" represents an unacceptable threat to community connectivity. Labelling these as "temporary" closures masks a year-long rolling blockade.
- The proposal to backfill trenches with "temporary surfacing material" at the end of each working day is highly dangerous for rural road users. These temporary fills quickly settle, crack, and wash out under heavy weather, leaving structural "water cuts," dangerous open edges, and severe tire-shredding potholes that directly threaten the safety of local drivers, cyclists, and agricultural machinery.

10.10 Quarry Routing and Cumulative Haul Concentration

The community identifies a contradiction in the Applicant's construction haul-route logic (Chapter 14, S14.5.3 and S14.7.9).

The Applicant claims that because quarry material will be "principally from the south (Dowlings)" via the R433, L3246 and N62, there will be "limited effects on Birr town" (S14.5.3) and that the predominant HGV approach will avoid Birr Town Centre (S14.7.9).

This understates that **all three identified quarry sources** — Loughnane Concrete (Birr), Dowling Quarries (Lisduff) and Kilsaran (Tullamore) (Chapter 14, Table 14-2) — converge on the same terminal corridor: the **N62 and the R492**. Whatever the origin, the final approach funnels through the same constrained local pinch points. The "principally from the south" assumption is precisely that — an assumption — and the Applicant provides no binding commitment that the northern sources will not be used.

Finally note the inconsistency between documents. The EIAR (Table 14-2) gives the Dowling route as "R433, L3246, N62, R492," while the TMP (S4.5/S5.5) gives it as "R433 → L3247 → L3246 → N62 → R492," adding a local road (L3247) not referenced in the EIAR chapter. The community cannot be confident which local roads will in fact carry aggregate fleets.

10.11 Minimisation of Environmental Impacts in "Residual Effects"

The community objects to the characterisation of residual effects in Chapter 14, S14.10, which significantly understates the impact on the local road network.

- **The "not significant" characterisation.** The Applicant concludes that, with design mitigation (onsite borrow pits, use of existing forestry tracks), the residual average construction traffic effect is a "short-term, slight, negative effect (not significant)" (S14.10.1). The community submits that a 24-month construction phase generating sustained heavy traffic on a single narrow regional road is not properly described as "slight."
- **The concrete-pour peaks.** The Applicant accepts (S14.10.1) that the worst-case residual impact is equivalent to the peak impact on the L1071 and R492, but describes the 10-day foundation-pour programme as a "short-term negative effect." For residents on these roads, a heavy vehicle every 6.6 minutes (S10.6 above) is a significant interruption to road access, not a passing inconvenience.
- **The internal tension in the labelling.** The Applicant acknowledges that temporary traffic management will have a "moderate negative temporary effect" on existing road users and that the cabling works will likewise have a "moderate negative temporary effect" on local roads (S14.10.1), yet attaches the label "not significant" to both. An effect that moves road conditions to "moderate negative" across a 12.23 km corridor for approximately 50 weeks is, in the community's submission, significant to the safety and daily livelihood of the rural population.
- **"Very short duration" closures.** The Applicant asserts (S14.10.1) that cabling closures will be off-peak and of "very short duration." This sits uneasily with S14.8.2.4, which records progress of 250 m per week with up to 100 m of trench open at any one time over the full 12.23 km. A rolling operation of that length and pace cannot reasonably be described, in aggregate, as of "very short duration."

10.12 Threat to Protected Architectural Heritage: Statutory Violations and Structural Omissions at the 1850 Sharavogue Bridge

While the applicant notes that national routes like the M7 possess sufficient structural capacity for heavy freight, they fail to provide localised, non-destructive structural integrity guarantees for the historic masonry arch bridges and vulnerable culverts spanning the regional (R492, R439) and local (L3246, L1071) road networks.

The community highlights a critical, non-compliant omission in the applicant's transport and infrastructure assessment regarding the historical infrastructure at Sharavogue. The proposed Turbine Delivery Route (TDR) and heavy haulage strategy require the continuous traversing of the masonry arch bridge on the R492 at Sharavogue, constructed in 1850. The applicant treats this historic asset as a generic public road link, completely failing to address its structural limitations.



Single-arch masonry bridge, constructed c.1850, carrying the Sharavogue Shinnrone road over the Little Brosna River. Rock-faced sandstone parapets with rusticated quoins. Dressed string course. Segmental profile arch. Rusticated voussoirs. Roughly dressed blocks to spandrels. Parapets coped with dressed limestone blocks. Wing walls of sandstone blocks.

Sharavogue Bridge is situated beside the Sharavogue railway bridge and together the bridges add to the architectural heritage of the area. It was built on the site of an earlier eighteenth-/early nineteenth-century bridge which was replaced by the Board of Works as part of the Little Brosna drainage scheme works from 1848-1852.

- **Absence of a structural capacity assessment.** Neither Chapter 14 nor the TMP contains any non-destructive testing or structural capacity calculation demonstrating that this historic masonry structure can withstand AIL wheel-loads. The TMP (S4.6, S5.6.5) states the AIL route was selected on the basis of "bridge capacities," but no bridge assessment is reproduced or referenced for the Sharavogue structure specifically.
- **Statutory protection.** The community understands the Sharavogue masonry bridge to be a heritage asset of the type protected under the Offaly County Development Plan 2021–2027 (Record of Protected Structures / NIAH). The local authority is required to protect such structures from damaging interventions, and the community submits that a structural integrity audit should precede any AIL movement across it.
- **Direct Conflict with Multi-Axle AIL Configurations:** The physical geometry of this historic masonry structure—characterised by narrow roadways, low load-bearing parapets, and an un-engineered stone arch—is fundamentally incompatible with

modern wind turbine haulage. The large axle configurations combined gross vehicle weights exceeding 100+ tonnes, and the wide wheel-tracks of specialised turbine transporters will exert unprecedented horizontal shear and vertical structural loading stresses directly on the 1850 stone arch.

10.13 Structural Objections to the Foynes Port Turbine Delivery Route (TDR) and Swept Path Failures

The community strongly challenges the applicant's reliance on Section 14.5.5 regarding the abnormal Indivisible Load (AIL) transport plan. The proposal to haul large turbine components from Foynes Port, Co. Limerick, via the N69, N18, M7 (Junction 21), R435, R445, through Roscrea town on the N62, and finally down the R492 via Sharavogue crossroads features severe real-world operational errors:

- **The Sharavogue Crossroads Failure:** The applicant explicitly admits that the current public road footprint is completely physically incapable of accommodating these oversized loads without intrusive modifications. Forcing multi-axle heavy haulage transport to cut across private lands at Sharavogue crossroads via "temporary hardcore placement" represents a high-impact, temporary industrial bypass that will damage the local landscape and alter agricultural soil structures.
- **Sweeping Radius/ Auto track Fallacy:** The community completely rejects the applicant's reliance on desktop Auto track simulations (Appendix 2-1) to claim feasibility. These software programs assume perfectly cleared sightlines, static boundaries, and zero vertical margin of error. The sweeping radius required for modern wind turbine blades will cause severe spatial conflict with historic roadside stone boundaries, century-old hedgerows, and overhead utility lines.
- **Widespread Environmental and Ecological Stripping:** Labelling the extensive removal of mature hedgerows and the stripping of natural margins as mere "hedgerow trimming/clearing" is an egregious underestimation of local ecological destruction. These lines form the protective, stabilising boundary of our regional and local road network. Stripping them back destabilises adjacent road ditches, accelerates edge-breakage, and permanently strips the rural character from the regional road corridors.
- **Severe Urban Gridlock and Administrative Risk:** Funnelling these turbine configurations along the R445 and directly northwest through the historic Roscrea town

on the N62 is a logistical hazard. The applicant passes the entire operational risk of this decision down the line by stating that road opening licenses, local authority agreements, and Garda escorts will simply be sought "in a timely manner" by an unnamed appointed Contractor. This casual treatment of administrative and structural risk offers zero protection against the complete gridlock of regional commerce and localised structural vibrations near fragile town centre foundations.

10.14 Compound Construction Traffic and Major Storage Depots of the Shannon Pipeline Project

The community objects to the applicant's failure to adequately consider the severe, overlapping traffic impacts of a major concurrent infrastructure project within our community. Uisce Éireann's multi-billion-euro **Shannon-to-Dublin Water Pipeline Project** (Water Supply Project Eastern & Midlands Region, Case Reference PA92.324279/323980) will cut directly through this exact geographic corridor, requiring an expansive 50-meter-wide temporary working easement.

- **Immediate Infrastructure Proximity at Corolanty:** The spatial conflict between these two projects is critical. The proposed wind farm site redline is adjacent to the borders of the pipeline's path, placing the nearest wind turbine infrastructure at a critical, minimal distance from the proposed pipeline crossing point at **Corolanty, Shinrone**. Forcing two heavy industrial construction footprints to operate practically on top of each other creates an unacceptable concentration of risk for residents.
- **Industrial Traffic Overlap:** Pipeline installation utilises an open-cut trenching method requiring a continuous fleet of Heavy Goods Vehicles (HGVs) to transport thousands of tons of imported pipe bedding materials, and 1,600 mm structural steel pipes. This large-scale water project is moving forward on an overlapping timeline with the proposed wind farm's construction phase.
- **Storage Depot at Boveen:** The pipeline scheme establishes a pipe storage depot directly inside our immediate local network, in the townland of **Boveen, Co. Offaly**. This logistical base will operate as centralised, high-frequency loading yard. The depot will facilitate a persistent, secondary industrial fleet of multi-axle HGVs directly onto the regional network to facilitate the construction of the project.

-

10.14.1 Pipe Storage Depot 3 – Boveen, Co. Offaly

- Located on agricultural lands with direct access onto the N62 National Secondary Road, routing directly down to the regional and local junctions feeding the Ballincor/Corolanty corridor.
- Average Daily HGV Traffic: Proposed to generate an average of 35 to 50 HGV movements per day during active storage cycles.
- Peak Surge Traffic: Can spike up to 80 HGV movements per day during concentrated multi-axle pipe haulage drop-offs.

10.14.2 Cumulative Effect on the R492

The traffic volumes from the Shannon Pipeline civil works from Boveen depot operations, and the Ballincor Wind Farm development onto the **R492** will completely exceed the carrying capacity of this regional road. The community rejects any transport assessment that treats our local roads as isolated corridors. The combined axle-loading of the pipeline's aggregate and pipe fleets alongside the wind farm's 186 continuous concrete-pour HVs will result in immediate subgrade collapse and structural failure of the R492 pavement.

The pipeline construction requires major direct road crossings and extensive trenching adjacent to the R492, which will already be curbed single-lane closures, temporary traffic systems, and rolling blockades. Forcing large multi-axle wind turbine transport units (AILs) and daily wind farm heavy construction fleets into a narrow regional road corridor that is simultaneously acting as a haulage corridor for two major pipeline storage depots is a logistical failure that will leave the communities along the R492 in a total isolation.

10.15 Rejection of the Applicant's "Imperceptible / Not Significant" Conclusion

The community respectfully but firmly rejects the Applicant's overall conclusion (Chapter 14, S14.13) that "the residual effects on the road network will be imperceptible / not significant." That conclusion is not consistent with the Applicant's own narrative of a 12.23 km trenching

operation, up to 100 m of open trench at a time, lane closures on the R439, and a 24-month construction phase concentrated onto a single narrow regional road.

Under the EPA's own terminology, an "imperceptible" effect is one that is without noticeable consequence. The community submits that an effect comprising nearly a year of rolling road works, structural trenching of the public carriageway, and sustained heavy-vehicle movement through local pinch points cannot be classified as imperceptible, and that the use of that classification undermines confidence in the objectivity of the transport assessment as a whole.

10.16 Mandatory Planning Conditions and Protections Required

Should An Coimisiún Pleanála decide to grant permission for this development despite the community's strong opposition, we request that the following legally binding, non-negotiable conditions be attached to protect our lives, safety, and local infrastructure.

Condition 1: Supplementary Municipal District Funding for Immediate Repairs & Water Cuts

Prior to any development, enabling, or trenching works commencing on-site or within the public road network, the developer must be legally required to provide a dedicated, ring-fenced fund directly to the local Municipal Districts of both Offaly and Tipperary.

- This fund must be strictly ring-fenced for immediate emergency patching and the permanent rectification of hazardous "water cuts," trench settlement, or pavement damage caused by the grid connection and development works.
- This extra funding must remain fully liquid and accessible to the MDs for the entire duration of the construction phase, the 50-week rolling trenching programme, and the subsequent commissioning phase, ensuring residents do not have to navigate hazardous, broken, or improperly backfilled roads while waiting for the developer to act.

Condition 2: Full-Lifecycle Financial Bond

To ensure the developer cannot walk away leaving the community with ruined infrastructure, a substantial Financial Bond must be lodged with the Planning Authorities prior to commencement.

- This bond must be secured and maintained in force for the full duration of the project lifecycle, explicitly including the decommissioning phase.
- This guarantees that total structural restoration, full-width road overlays, and trench remediation can be fully funded and executed independently if the developer fails to reinstate the roads to an improved, safe standard.

Condition 3: Engineered Site Entrance Surfacing

To prevent severe damage to the public road edge and stop stone/aggregate migration onto the R492 and L1071, the site entrances must undergo heavy civic stabilization works before heavy construction begins.

- A minimum length of 100 meters of the internal site access track, measured back from the public road boundary, must be fully surfaced as a bound structural pavement layer immediately following site mobilization.
- Within this area, the first 50 meters directly leading into the site from the public road edge must be fully surfaced in high-durability asphalt (asphalt concrete) to withstand heavy turning axles and protect the public road interface from collapsing under heavy civic works.

Condition 4: Mandatory Automated Wheel Wash Facility

To ensure our community roads are kept completely free of dangerous mud and debris, a heavy-duty, automated, high-pressure Wheel Wash System must be installed.

- This facility must be located precisely **50 meters inward from the entrance**, positioned directly on the newly specified internal asphalt track.
- Every single heavy vehicle leaving the construction site must be washed down completely before its tires ever touch the public road network.

Condition 5: Independent Before-and-After Bridge Surveys

To protect the integrity of local bridges and culverts, particularly along the R492, R433, R439 grid corridor, and vulnerable local road L3246, an independent structural engineering firm must be appointed to conduct rigorous surveys.

- A Before-Works Baseline Survey must be completed and published to the local authority and community before any construction, trenching, or component delivery vehicles enter the network.
- An After-Works Validation Survey must be conducted immediately post-construction. Any structural displacement, masonry cracking, or weakening identified must be remediated immediately at the developer's sole expense.

Condition 6: Maximum Sightline Enforcement and Mandatory 215 m Visibility Splays

The primary site entrance joins the R492 where a posted speed limit of 80 km/h combined with a narrow, winding alignment poses a major risk when interacting with slow-moving construction traffic and heavy vehicle tail-swing.

- **Binding Implementation of Claimed Splays:** Prior to the commencement of any on-site civil works, the developer must fully construct and implement the maximum visibility splays asserted in their Environmental Impact Assessment Report. A strict visibility triangle maintaining a minimum 3 m x-distance setback and an entirely unobstructed 215 y-distance in both directions must be physically established at all site access junctions.
- **Physical Obstruction Restrictions:** No hedging, boundary walls, earthen embankments, or construction signage shall be allowed to exceed 1.0 m in height within these structural visibility triangles. This splay must be maintained at the developer's sole expense throughout the entire 24-month construction phase and the full operational lifecycle of the wind farm to guarantee adequate stopping sight distances for local motorists.

Condition 7: Blackbull Junction Traffic Management & Advanced Variable Signage

To actively combat the traffic extensification and queuing hazards at the Blackbull junction (N62/R492), the R439 grid trenching zones, and the site entries, the developer must be mandated to install a comprehensive, high-visibility digital warning and management system.

- Solar-powered Electronic Variable Message Signs (VMS), alongside static high-reflectivity warning signs, must be deployed at all key approaches to the Blackbull crossroads, the R439 / L70152 grid junction, and along critical haul roads (including the L3246 and R433).
- These electronic signs must actively display real-time, dynamic updates regarding "Heavy Construction Traffic Ahead at Blackbull," "Road Closures / Open Trench Operations Ahead," and expected delay durations to allow residents, school transport, and agricultural users to navigate the network safely.
- No standard delivery convoys or non-emergency works shall be permitted to traverse the Blackbull junction during peak local transit hours (08:15–09:15 and 17:00–18:00).

- Concrete Pour & Trenching Notification Protocol: On days scheduled for continuous foundation concrete pours (delivering 9 HVs per hour) or active road trenching, the developer must issue an automated VMS alert 72 hours in advance. No trenching operations or concrete transit movements shall intersect local school transport routes during drop-off and pick-up hours. All out-of-hours or night-time turbine deliveries must be flagged via VMS 48 hours in advance to protect sleep and night-time driving safety.

Condition 8: Mandated Independent Stage 2, 3, and 4 Road Safety Audits

To ensure safety changes are not restricted to preliminary design stages, the developer must fund a rolling regime of independent Road Safety Audits across the lifetime of the project.

- Prior to the close of detailed design, a Stage 2 RSA must be completed and submitted to the local authorities.
- Immediately upon completion of the site entrance works and before any operational or component haulage phase begins, an independent Stage 3 RSA (incorporating daytime and night-time site drive-overs) must be carried out to verify the live safety of the junctions.
- A Stage 4 RSA (monitoring live collision data and near-miss feedback) must be completed 12 months into the operational phase to confirm that no permanent road safety hazards have been left behind. All recommended interventions from these audits must be fully funded and executed by the developer.

APPENDIX 7: Site Selection

Chapter 2: Site Selection, CDP and Coolglass

- Appendix 2-1: Red III Parliamentary Question**
- Appendix 2-2: ACP Precedent on CDP**
- Appendix 2-3: Joint Committee Energy and Climate; ACP CEO and Senior Planner CDP position**

2.0 Introduction

This chapter addresses a single question: whether the Ballincor Wind Farm can be granted permission on a site that both the Offaly and Tipperary County Development Plans have, through formal statutory process, designated as Not Suitable for wind energy development. The answer, applied across empirical, statutory and legal frameworks, is that it cannot.

The factual position is striking. County Offaly has designated 28% of the county as suitable for wind energy development. Offaly produces approximately 11% of Ireland's renewable electricity from 2% of the State's land area, and 25% of total wind energy output in the Eastern Region alone. This is in the context of some counties in our region generating zero.

Offaly is not a county failing to meet its obligations. It is delivering far beyond them, and doing so within the suitable areas its County Development Plan has designated, with a further pipeline of more than 1GW planned to 2032 that remains within those designated areas (Green Energy Conference 2026, Tullamore Court Hotel, 25 February 2026). The question before An Coimisiún Pleanála is therefore not one of necessity, but one of appropriateness and site location.

On site location, the position is equally clear. The Offaly County Development Plan 2021–2027 Wind Energy Strategy applied a step-by-step sieve-mapping methodology — assessing wind speed, grid access, landscape sensitivity, designated ecological sites, flood risk, housing density and heritage. Ballincor failed on every single criterion (Offaly CDP 2021–2027, Wind Energy Strategy). The site sits within a High-Moderate Scenic Sensitivity zone, adjacent to Sharavogue Bog SAC (within 10m, per the Applicant's own Natura Impact Statement, Table 5.1), within the River Brosna hydrological corridor, in a documented flood zone, with no transmission infrastructure within reasonable proximity, amongst the lowest wind speed category in the county, and with over 300 receptors within 2km of the development envelope. The designation of Not Suitable is not incidental or precautionary — it is the cumulative output of a rigorous, SEA'd, AA'd and OPR-reviewed statutory exercise.

The applicant's own evidence reinforces this conclusion rather than displacing it. The Applicant's site selection criteria, set out in EIAR Chapter 3, list eleven factors including environmental constraints, population density, planning policy, landscape/visual

constraints and reasonable access to the national electricity grid. The post-hoc justifications the Applicant offers for Ballincor are each directly contradicted by the CDP's findings on the same criteria for the same site. Further, the Applicant has not chosen Ballincor in preference to alternatives. It has simultaneously pursued all five 'alternatives' identified in its scoping exercise. This is a portfolio strategy, not a reasoned site selection.

The legal framework points the same way. The Supreme Court in *Coolglass Wind Farm Ltd v An Coimisiún Pleanála* [2026] IESC 5 confirmed that the designation of an area in a CDP as not suitable for wind farm development is itself an exercise of proper planning and sustainable development (S.91); that compliance with a climate-aligned CDP will normally satisfy the Section 15(1) climate obligation S.112); and that approving wind development in a protected area within a county where multiple windfarms have already been approved would "make a nonsense of the elaborate structure" of the planning system (S.87). The S.87 hypothetical, constructed deliberately by the Court, maps almost precisely onto the facts of Offaly and Ballincor. The OPR reviewed the Offaly CDP without adverse intervention on the Not Suitable designation, a factor the Supreme Court confirmed at S.129–130 is a proper consideration for the Commission. An Coimisiún Pleanála's own position reinforces this. At the Joint Oireachtas Committee on Climate, Environment and Energy (26 November 2025), ACP's Chief Executive Peter Mullins and Director of Planning Ciara Kellett confirmed that it would be "very strange" for the Board to grant permission outside areas designated through a statutory spatial planning process.

These five strands — Offaly's empirical performance against national renewable targets, the statutory weight of Offaly's County Development Plan and its Wind Energy Strategy, the applicant's inconsistency with its own stated site selection methodology, the established practice of An Coimisiún Pleanála in CDP exclusion zones, and the authority of the Supreme Court in *Coolglass* — are not separate arguments. They are mutually reinforcing components of a single conclusion: that the proposed Ballincor Wind Farm is contrary to the proper planning and sustainable development of the area.

This chapter develops that conclusion through three sequential positions. The first establishes the primacy of the County Development Plan on the law and the facts applicable to this site. The second engages directly with the question the Supreme

Court in Coolglass requires the Commission to ask under s.37G(6) — whether the climate benefit of this particular development justifies material contravention of two County Development Plans — and demonstrates that it does not. The third identifies the mandatory legal preclusions, grounded in EU and Irish law, that climate benefit arguments cannot displace.

An Coimisiún Pleanála is tasked with navigating a dense and at times competing framework of national policy, EU and domestic directives, statutory regulations, technical guidance, environmental principles and an evolving body of case law. That complexity is acknowledged. But complexity does not dilute clarity. When the relevant provisions are properly aligned and assessed cumulatively — across policy, law, environmental protection and proper planning principles, the outcome in this case is not finely balanced. On each determinative issue, empirical, statutory, evidential and legal, the proposed development conflicts with the governing framework.

Refusal is not one of several reasonable conclusions, it is the only conclusion consistent with the law, the evidence, and the statutory mandate of An Coimisiún Pleanála.

2.1 Context: Offaly – The leading provider of Wind Energy output in Ireland

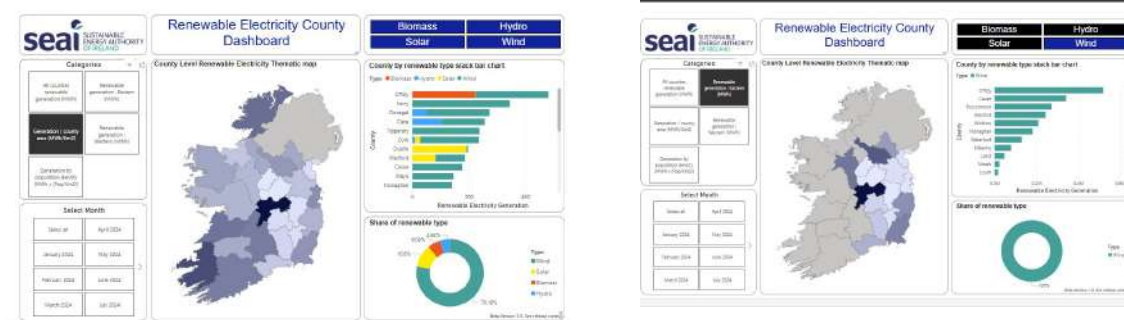
Wind Energy Ireland claimed that for 2024, 32% of electricity in Ireland was renewable and added that “No other country in Europe gets a higher proportion of their electricity from onshore wind than Ireland.”

Within that performance and context In January 2026 County Offaly was the **number one** county for renewable energy output. Offaly is consistently ranked in the top 3 performers across the country.

Figure 2.1 Renewable Energy Outputs

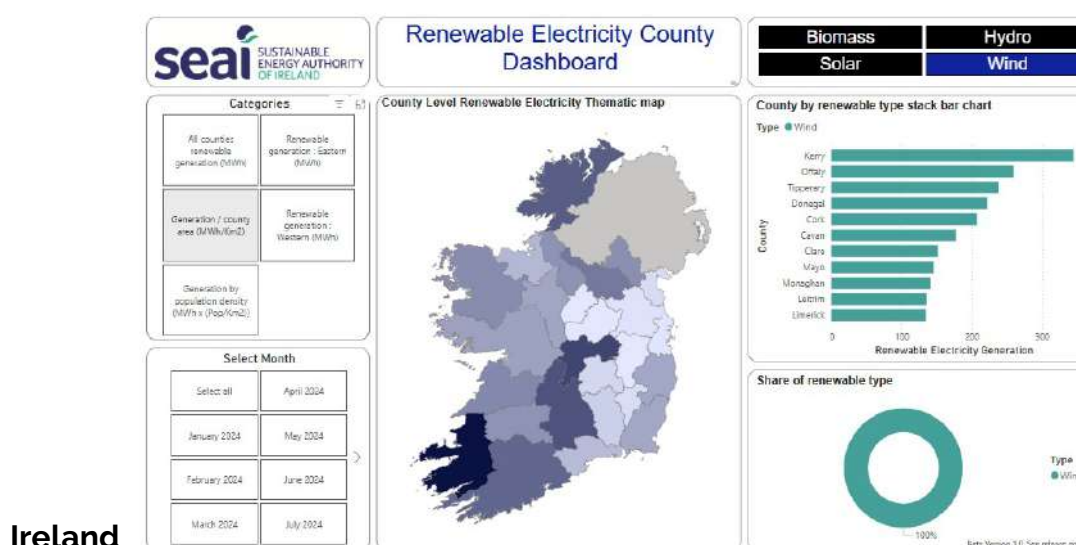
Renewable energy by County Area

Wind output by County in Eastern Region



<https://www.seai.ie/renewable-energy/renewable-electricity/about-dashboard/dashboard>

Figure 2.2 Wind output by County All of



<https://www.seai.ie/renewable-energy/renewable-electricity/about-dashboard/dashboard>

This is in contrast to other leading counties - Cork, Kerry, and Mayo, which benefit from large land bases and extensive hinterlands. Offaly is notably smaller in scale (2,001 km²; population 83,150). See Table 2.1 below.

Table 2.1 County Comparisons

County	Population	Land mass (km²)	% of Republic's land area
Cork	584,156	7,508	10.73%
Kerry	156,458	4,807	6.87%
Mayo	137,231	5,588	7.99%
Offaly	83,150	2,001	2.86%

These figures do not include additional windfarm permissions granted but not operational, the most recent being a development in Cush (57MW) and another in Carrig (44 MW). Offaly delivers 11% of National renewables on a landmass of 2% of the country.

The statistics become more stark when considered at a Regional level. Table 2.2 below displays the Wind Energy output figures for all counties in the Eastern Region.

Table 2.2. Wind Energy Output – Eastern Region

Offaly	519675 MWh	25% of total
Cavan	341902 MWh	16
Roscommon	270816 MWh	13
Wexford	243444 MWh	12
Wicklow	208697 MWh	10
Monaghan	182048 MWh	9
Waterford	130129 MWh	6
Kilkenny	77903 MWh	4
Laois	46732 MWh	2
Meath	22408 MWh	1
Louth	16335 MWh	1
Carlow	15650 MWh	1
Dublin	0 MWh	0
Kildare	0 MWh	0
Longford	0 MWh	0
Westmeath	0 MWh	0

SEAI County Dashboard : <https://www.seai.ie/renewable-energy/renewable-electricity/about-dashboard/dashboard>

Offaly is the leading wind energy producer by a considerable margin. Offaly delivers **one quarter or 25%** of total wind energy output in the Eastern Region. Also note the performances of Dublin, Kildare, Longford and Westmeath. As a county Offaly has contributed beyond its land-mass, population and capacity.

This is a critical starting point in our Submission. The Supreme Court ‘Coolglass’ judgement raises the point that Developments have to be considered beyond their local jurisdiction or county boundary. Where suitable and more optimal sites exist elsewhere, the selection of a sub-optimal site — particularly within an area designated as unsuitable and in a county already exceeding its contribution — cannot be justified and is fundamentally unreasonable, inequitable and manifestly unfair. At what threshold will Offaly be considered saturated?

Figure 2.3 below shows existing and future Renewable energy plans within the county.

Figure 2.3: Future Pipeline – within Designated Areas

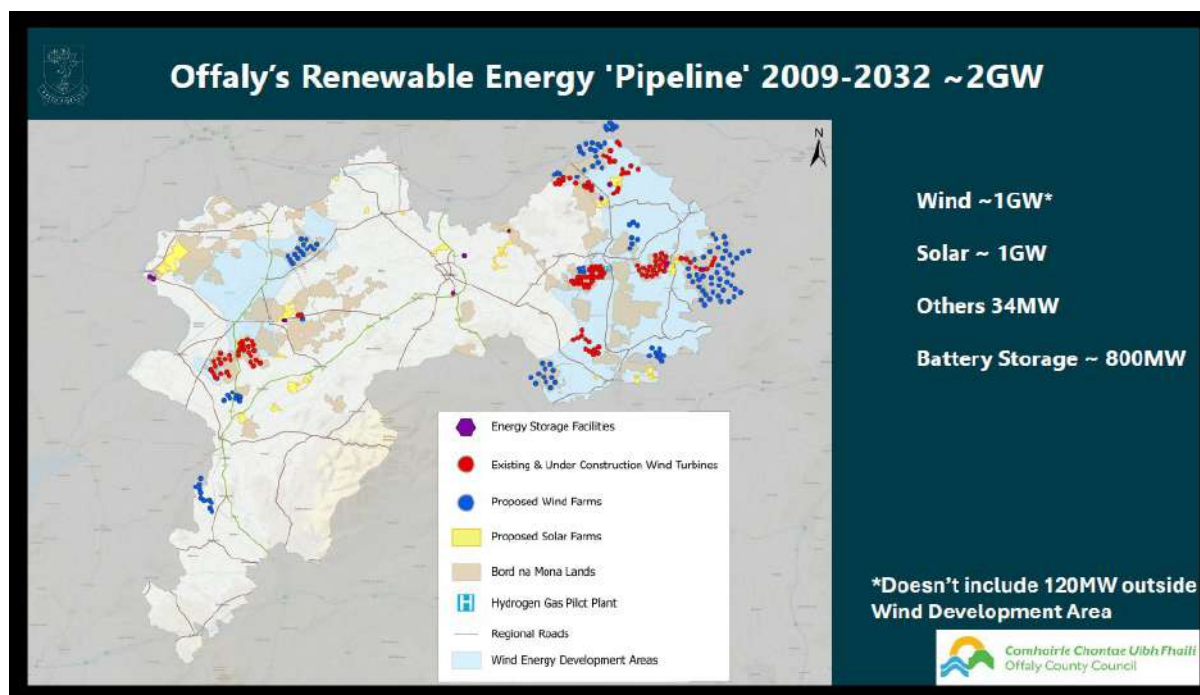


Image taken from Presentation at Green Energy Conference 2026, Tullamore Court Hotel 25/02/2026

The achievements and contribution of County Offaly to renewable targets to-date has already been discussed. The map above presents the planned pipeline and ambition of the county to deliver up to 2032. Note in the bottom right-hand corner that this Pipeline does **NOT** include 120MW 'outside' the wind development designated areas. Offaly County Council are clear that targets can be met within designated areas and consider sites outside designated areas (Ballincor) unnecessary and extraneous to the targets for the county.

To the credit of Offaly County Council, all of this has been achieved through sustainable planning and within the parameters of the Offaly County Development Plan 2021-2027: Wind Energy Strategy. Clearly the approach guided by the Government, the Eastern & Midland Regional Assembly Regional Spatial & Economic Strategy 2019-2031 and executed by Offaly County Council is delivering to the highest standard. To contravene the explicit plans and designations of Offaly County Council is to wholly undermine the planning process.

All of this to say that Offaly is already making an extraordinary contribution to national renewable electricity targets. Planning decisions should explicitly recognise the

county's existing role and cumulative delivery in the national context. Offaly is a county approaching saturation on a per capita and per km² basis.

2.2 Offaly County Development Plan – Wind Energy Strategy

The Offaly County Development Plan Wind Energy Strategy has designated 28% of the county's land as suitable for wind energy development. That commitment was established through a formal, statutory plan-making process. Expertise across the County Council prepared the plan on an evidence-led basis (population and housing need, settlement hierarchy, infrastructure capacity, transport and mobility, economic development, community facilities, environmental and heritage constraints, climate adaptation, flood risk, biodiversity/green infrastructure, etc.) and then published it through staged public consultation. Elected members considered the report and ultimately adopted the Plan as the county's primary spatial policy framework. The process was also "quality-controlled" externally to ensure alignment with higher-level national and regional policy and it was subject to statutory environmental assessment (including SEA/AA processes) and oversight/submissions from bodies such as the Office of the Planning Regulator.

The Wind Energy Strategy specifically followed a similar process and was guided in its development by the Eastern & Midland Regional Assembly, Regional Spatial & Economic Strategy 2019-2031. This strategy proposed a 'step by step' sieve mapping analysis of the key environmental, landscape and technical criteria which, it stated, must be balanced in order to identify the most suitable locations for wind energy development.

The following is an extract from the Offaly County Development Plan Chapter 3 (Section 3.2.6) detailing Site selection and site suitability designation criteria

Site suitability is an important factor in determining the suitability of wind farms having regard to possible adverse impacts associated with, for example, residential amenities, landscape, including views or prospects, wildlife, habitats, designated sites, protected structures or bird migration paths and compatibility with adjoining land uses. The Council is therefore required to achieve a reasonable balance between responding to overall positive Government policy on renewable energy and enabling the wind energy resources of the Planning Authority's area to be harnessed in a manner that is consistent with proper planning and sustainable development. The Council recognises that community ownership of wind energy projects enables local communities to benefit directly from

local wind energy resources being developed in their local areas, ensuring long-term income for rural communities.

Offaly's Wind Energy Strategy followed the recommended approach and provides a formal site suitability framework, because it explicitly:

- 1. Used a step-by-step sieve mapping analysis to identify suitable locations.*
- 2. Supplemented that with field analysis and desktop survey, informed by SEA and AA.*
- 3. Defined "not suitable" areas by reference to environmental, heritage, landscape constraints and housing density.*

Extract from County Development Plan Chapter 3 Climate Action and Energy Page 75

In so doing, the Offaly County Development Plan 2021-27 specifically addresses the issue of 'Site suitability' across the full spectrum as required. In its conclusion 28% of County Offaly has been designated for Windfarm development, over one quarter of the county.

2.2.1 National and European application

Further and specific to Wind Energy in particular, the role of the CDP has been extended to act as representative for a National SEA for wind energy. Ireland is legally bound by the EU Strategic Environmental Assessment (SEA) Directive to complete a full environmental assessment of any public plan or programme that sets the framework for future development and is likely to have significant environmental effects. A national wind energy strategy clearly meets that threshold.

In the absence of a coherent national Strategic Environmental Assessment for wind energy, the Irish Government has **consistently maintained that this obligation has been met through the preparation of County Development Plans**, which were expressly tasked with identifying areas where wind energy development is appropriate, constrained or not suitable.

Furthermore, Article 15b of RED III (Directive (EU) 2023/2413) requires Member States to carry out national territory mapping to identify areas suitable for renewable energy. In response to Parliamentary Question 164 (4 November 2025), the Minister confirmed that this obligation has been discharged by collating CDP designations from all local

planning authorities. Offaly CDP's Wind Energy strategy (and area designation) is part of Ireland's national renewable energy territorial map submitted to the European Commission. See Appendix 2-1.

This confirmation carries three direct consequences:

1. The CDP designation acts currently as Ireland's national instrument. A grant of permission for Ballincor would contradict Ireland's national territorial mapping submitted under RED III. The State would be acting inconsistently with its own EU law representations. This is particularly relevant in this Proposed development as the Applicant explicitly invokes RED III status and in so-doing is required to comply with the County Development Plan designation.
2. The CDP designation carries European, not merely local weight. It is not open to a developer or ACP to characterise the Offaly exclusion zone as a local policy preference that should yield to national climate objectives. It is the national climate objective, spatially expressed.
3. Collateral attack on the CDP is legally untenable. An individual planning application cannot collaterally attack a designation adopted as part of a national statutory process submitted to the EU Commission.

Therefore from a European, National, Regional and Local level the framework provided for in the Wind Energy strategy is acceptable and compliant.

2.2.2 Site Suitability : Ballincor – Sieve Mapping Exercise

The Wind Energy Strategy listed the practical suitability indicators underpinning designation. Table 2.3 below lists the criteria considered and the thresholds applied.

Table 2.3: Suitability Indicators

Criterion	Threshold Applied
Wind speed	> 7.5 m/s at 100 m hub height
Grid access	Within 15 km of transmission network
Setback to dwellings/settlements	As per national & local Development Management Standards (typ. ≥ 500 m–1000 m; project-specific)
Landscape sensitivity	Exclude High Sensitivity zones
Designated sites	Exclude SAC, SPA, NHA, pNHA

Criterion	Threshold Applied
Areas of High Amenity	Exclude areas of high amenity
Protected views / amenity routes	Avoid intrusion or dominance
Housing density	Prefer low / dispersed patterns Assess Population density, growth patterns

Based on this rigorous, independent, transparent and evidence-based assessment both the Offaly and Tipperary County Councils' respective Wind Energy Strategies deem the Ballincor site as **not suitable** for wind energy development.

The Ballincor Wind farm site area was determined to be:

- An area of high-moderate scenic sensitivity with elevated topography - Figure 2.4
- An area of below average wind speeds and no reasonable access to the national electricity grid - Figure 2.5, 2.6, 2.7
- An area requiring special biodiversity protections due to its proximity to Sharavogue Bog SAC, River Brosna SPA and Shinrone Heritage Area 2.8
- An area prone to recurring flooding - Figure 2.9

This independent analysis is in stark contrast to the assessment and conclusions of the Applicant. The following review and images are extracted directly from the Offaly Wind Energy Strategy and provide the detail, evidence and assessment absent from the Applicant's submission.

2.2.3 Landscape

The National Landscape Strategy for Ireland (NLS) 2015-2025 recognises the importance of landscape protection and its interconnectivity with biodiversity and climate change. Landscape sensitivity is assessed through the County Landscape Character Assessment/

Figure 2.4 below presents a map classifying landscape sensitivity across County Offaly. The map clearly shows the proposed site as an area of high sensitivity (red) with surrounding areas deemed medium sensitivity.

2.2.4 Windspeed and Grid Infrastructure

Figure 2.5 below maps the existing electricity grid infrastructure in County Offaly.

Figure 2.5 Existing Grid Infrastructure

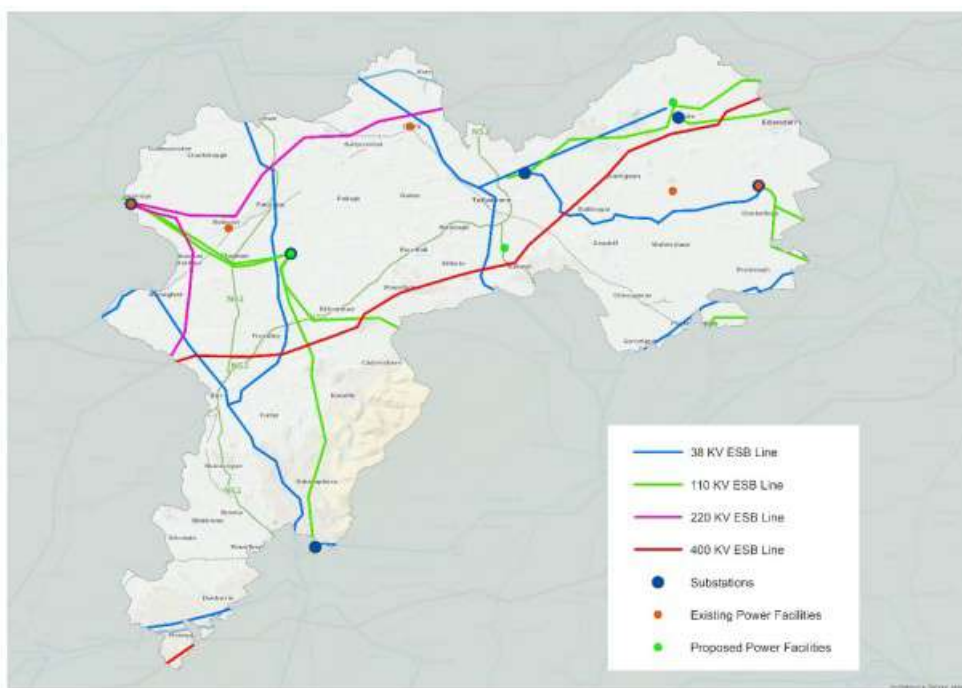


Figure 3.3 Existing Electricity Infrastructure in County Offaly

Note a concentration of infrastructure in designated zones across the county and a notable absence of infrastructure in the Ballincor area. Figure 2.6 below captures average windspeeds and identifies 12 'potential wind energy areas' across the county. Ballincor (white area) is not deemed capable of generating wind output to the degree required and is considered not suitable.

Figure 2.6 Average Windspeeds

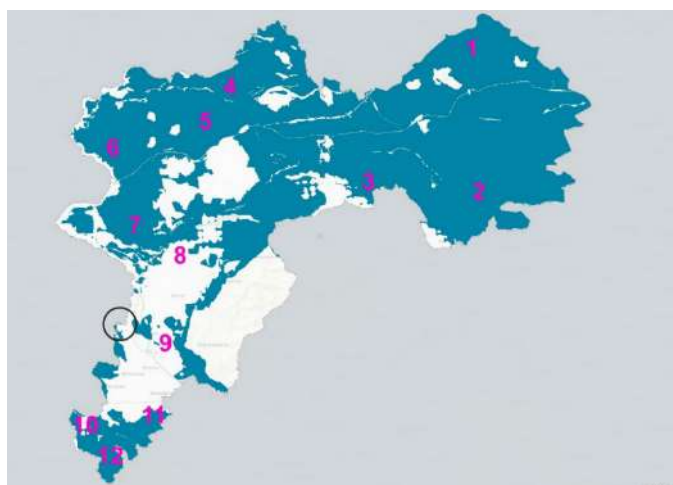
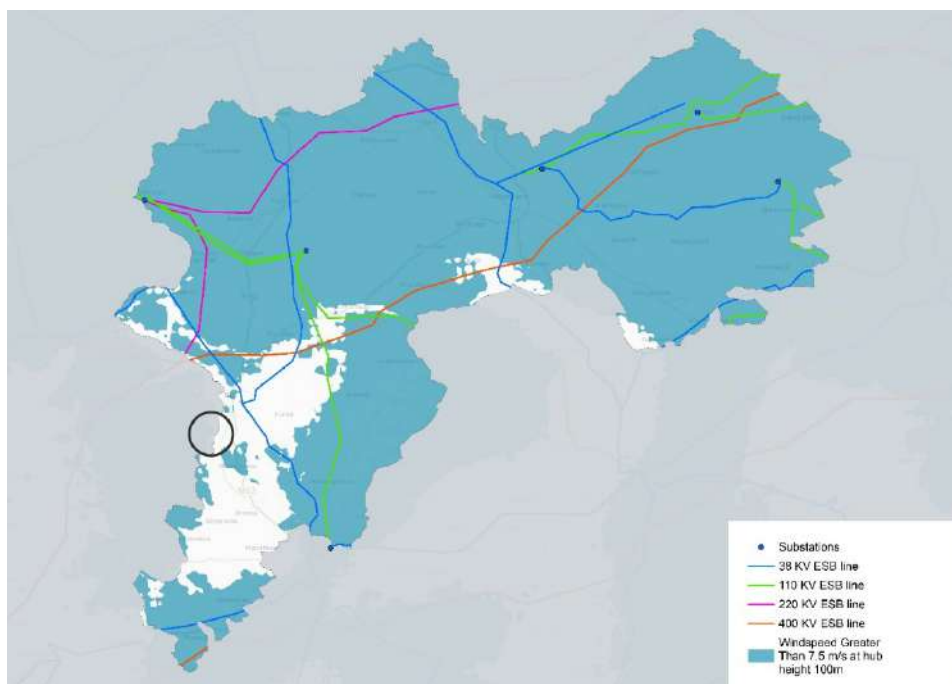


Figure 2.7 below captures the overlay between access to grid and wind capacity and presents the vast expanse of Co Offaly that offers both viable wind speeds and reasonable access to the national electricity grid. The Ballincor area does not adhere on either count.

Figure 2.7 Grid and Wind Capacity



A review of EirGrid's Grid Implementation Plan (2023–2028) and EirGrid's Transmission Development Plan 2021–2030 lists a series of reinforcements and upgrades across the existing network but no projects are planned to extend the current network/infrastructure within reasonable proximity of the Ballincor development site. Further the Application proposes the Dallow 110Kv as a base for grid connection. This sub-station is already overloaded or restricted. EirGrid's operational Wind Dispatch Tool documentation identifies contingency-driven constraint conditions involving the Dallow–Shannonbridge 110 kV interface and includes Dallow within defined constraint-group configurations. This demonstrates that generation connecting via Dallow 110 kV is exposed to binding transmission constraints and outage-related dispatch-down risk. Data from EIRGRIDS annual reports, see Table 2.4 below, shows that the rate of curtailment/constraint across the country is rising fast from 6% in 2020 to 13-14% in 2023. These numbers do not consider or include the spate of wind farm connections over the last 2 years nor the level of applications that have been granted permission but are not yet connected to the Grid.

Table 2.4 Annual Rates of Curtailment/Constraint

Year	Total Dispatch-Down % (approx.)
2020	~6%
2021	~9–10%
2022	~11–12%
2023	~13–14%

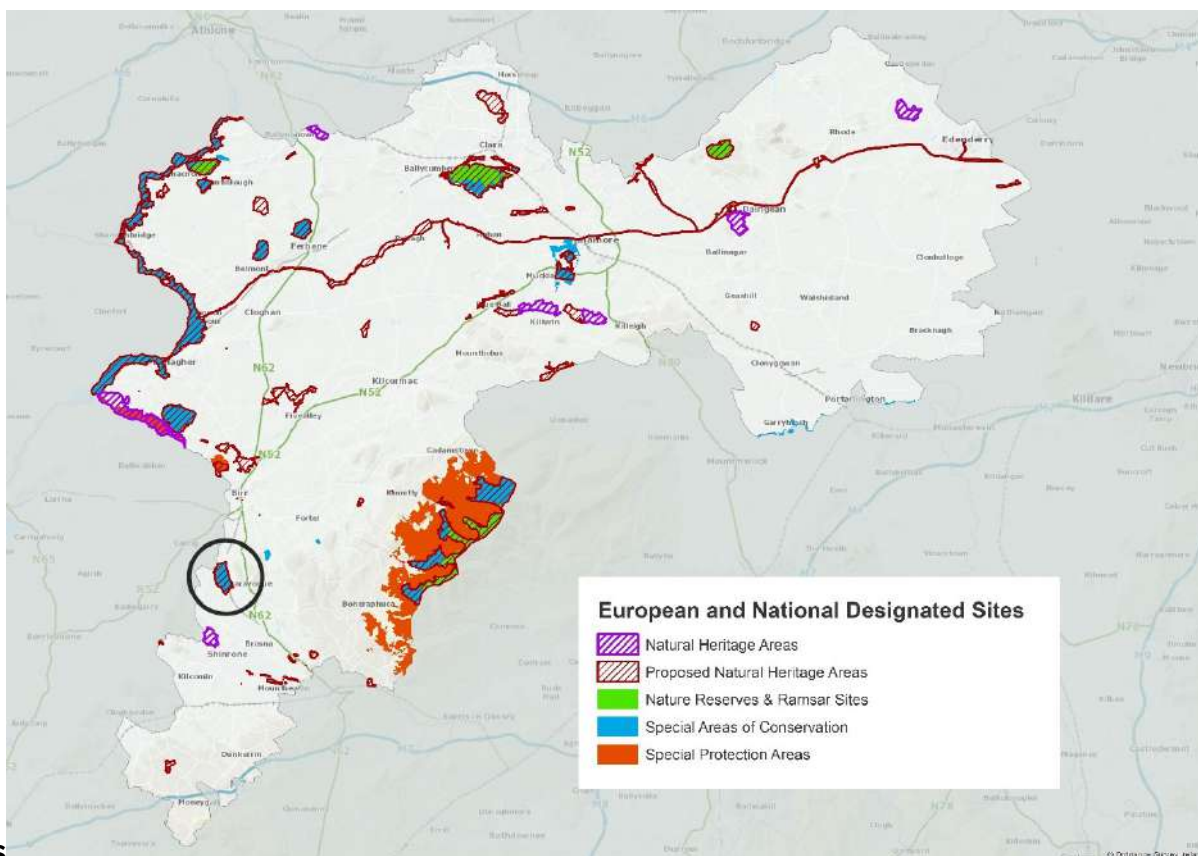
All of this calls into the question the legitimacy of a windfarm application when all agree the Grid is not ready nationally and as evidenced above locally. The cost is to the end user – the consumer, not the wind developer.

To choose a site far removed from existing and future planned infrastructure is unnecessary, inefficient and sub-optimal from a planning perspective generating additional and unnecessary environmental, social, civil and economic disturbance and displacement.

2.2.5 Biodiversity protections

Figure 2.8 below shows the extent and location of the European and National Designated sites in County Offaly as listed in Chapter 4 'Biodiversity and Landscape' in Volume 1 of the County Development Plan. Independent Appropriate Assessment screening was undertaken to assess the potential impacts of this Wind Energy Strategy on Natura 2000 sites. In addition, a Strategic Environmental Assessment was carried out to assess wider potential biodiversity impacts in relation to this Wind Energy Strategy. The proposed site Ballincor would lie adjacent to Sharavogue Bog SAC.

Figure 2.8 European and National Designated



Sites

Table 5.1 below extracted from the Applicant's AA/NIS document reaffirms this position as it confirms the **10m** distance between the development and Sharavogue Bog SAC. Further it confirms the potential for likely significant effects on this SAC.

Table 5-1: Assessment of Relevant European Sites Within the Zone of Influence and Potential of Likely Significant Effects.

Designated Site	QIs/ SCIs (*) indicates a priority habitat under the EU Habitats Directive)	Source-Pathway-Receptor Link	Potential for Likely Significant Effects
Shuravogue Bog SAC (000585) This SAC lies directly adjacent to the proposed project site (within 10m at its nearest location).	- Active raised bogs (7110) - Degraded raised bogs still capable of natural regeneration (7120) - Depressions on peat substrates of Rhynchosporion (7150)	Physical: The proposed project lies adjacent to the SAC, with the SAC boundary located at its nearest, 10m from the proposed project. The QIs for this SAC are terrestrial habitats only and these habitats will not be disturbed during the construction, operation or decommissioning of the proposed project. However, considering the distance between the SAC and the proposed project site (i.e. 10m) there is potential for impacts as the site occurs inside the ZOI for impacts associated with the generation of dust. There is a physical pathway for effects. Hydrological: The SAC is hydrologically connected to the proposed project via the Little Brosna, OAO River. The proposed project has the potential to result in a degradation of water quality of this river, and all hydrologically connected rivers downstream during the construction and decommissioning phases of the proposed project. However, the QIs for this SAC are terrestrial habitats only and these habitats will not be	Yes - A viable pathway for effect (via physical and hydrogeological connectivity) was identified between the proposed project site and this SAC. There is potential for likely significant effects on this SAC.

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Designated Site	QIs/ SCIs (*) indicates a priority habitat under the EU Habitats Directive)	Source-Pathway-Receptor Link	Potential for Likely Significant Effects
Ballyduff/Clonfinane Bog SAC (site code: 000643)	Active raised bogs (7110)	impacted via surface water quality impacts during the construction, operation or decommissioning of the proposed project. Hydrogeological: Both the SAC and the proposed project occur within the same groundwater body (Shinrone) (refer to Section 4.1.2). The SAC is designated for groundwater-dependent habitats (NPWS, 2015), which are sensitive to changes in groundwater regime. Due to the proximity to the proposed project site, the SAC occurs within the ZOI for potential impacts on groundwater. Accordingly, a hydrogeological connection exists, and a source-pathway-receptor linkage cannot be excluded. Ecological: The QIs for this SAC are terrestrial habitats only and there is no physical connectivity between the SAC and the proposed project. A Source-pathway-receptor link (via physical and hydrogeological) exists between the proposed project site and this SAC.	No - Considering that no viable pathways for effect could be

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The River Brosna runs along and within the proposed development site. The River Brosna forms part of a specially protected hydrological corridor that connects and links a wide range of SACs and SPAs, the most notable are the River Little Brosna Callows SPA, the Dovegrove Callows SPA, the River Shannon Callows SAC. This was explicitly referenced in the ACP Inspectors Report ABP 318666-23, dated Sept 15th, 2025 where the Inspector lists the full and vast range of SACs, SPAs and heritage sites in the area that required consideration as part of this Application. See full list below.

7.0 Appropriate Assessment

7.1.1. The prospective Applicant intends to submit a Screening for Appropriate Assessment (AA) and a Natura Impact Statement with the application.

7.1.2. Natura 2000 European Sites within 15 km of the site include the following:

7.2. Special Protection Areas (SPAs)

- River Little Brosna Callows SPA (004085) - 9.72 km north-west
- All Saints Bog SPA (004103) - 11.46 km north
- Dovegrove Callows SPA (004137) - 8.33 km north
- Slieve Bloom Mountains SPA (004160) - 12.55 km west
- Lough Derg (Shannon) SPA (004058) – 13.99 km west

7.3. Special Areas of Conservation (SACs)

- Sharavogue Bog SAC (000585) – 0.71km north-west
- Lisduff Fen SAC (002147) – 4.89 km west
- Ballyduff/Clonfinane Bog SAC (000641) - 4.82 km north-west
- Liskeenan Fen SAC (001683) - 6.34 km north-west
- Arragh More (Derrybreen) Bog SAC (002207) – 6.56 km north-west
- Kilcarren-Firville Bog SAC (000647) – 7.63km north-west
- Scohaboy (Sopwell) Bog SAC (002206) – 8.65 km southwest
- Island Fen SAC (002236) – 8.99 km north-west
- Ridge Road, SW of Rapemills SAC (000919) – 10.5 km north

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- All Saints Bog and Esker SAC (000586) – 11.5 km north-west
- Lough Derg, North-east Shore SAC (002241) – 13.47 km north-west
- Redwood Bog SAC (002353) – 13.9 km north-west

There is clear recognition that the River Brosna acts as a hydrological corridor connecting sites and many of these sites are connected functionally as a shared ecosystem. The Applicant has chosen to screen IN this river as a perimeter to their development and for the river itself to act as buffer to the adjoining, shared waterbody dependent SAC.

This section of the River Brosna (The Little Brosna_40) which would receive all construction run-off from Turbines T1-T9 is classified as Poor ecological status for the 2019-2024 WFD monitoring cycle and is formally at RISK of failing to meet 2027 objectives. This classification is a deterioration of previous classifications.

The cumulative effect is significant at a time when NPWS in their report “The Status of EU Protected Habitats and Species in Ireland 2025” conclude that “90% of habitats remain in Unfavourable status, with half showing ongoing declines.” They argue that this is not a neutral baseline. It is a national conservation deficit. In that context, any additional long-term pressure placed on SAC-related systems—particularly those dependent on stable hydrology and ecological function—must be evaluated with heightened precaution.

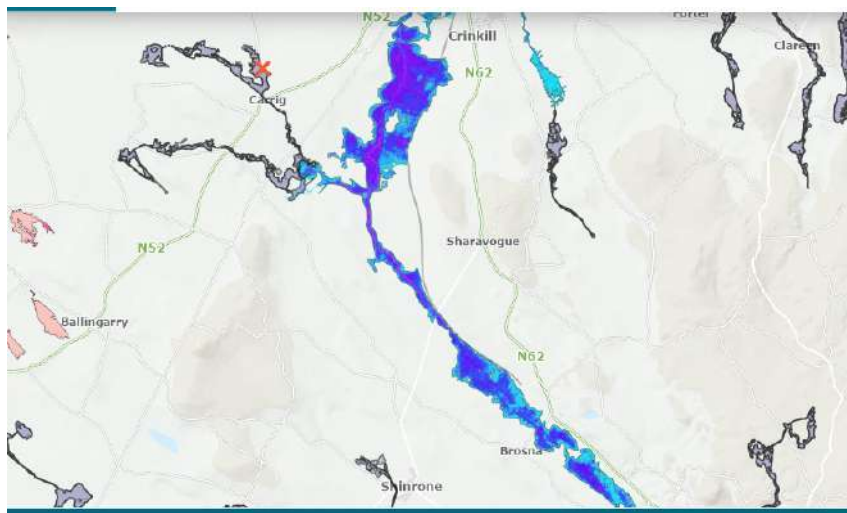
Offaly County Council considered these impacts and concluded that this area requires special protection and is therefore not suitable for windfarm development. Chapter 3, Chapter 5 and Chapter 6 will address these issues in more detail.

2.2.6 Flooding

The Wind Energy strategy does not include directly the propensity to flood in its sieve-mapping exercise but it is worth noting that this site is part of a year-round flood plain as evidenced by the map in Figure 2.9 below.

The Applicant proposes construction of T1, T2, T8 and T9 in areas classified as Flood Zone A/B even though PSFRM Guidelines classify windfarms as infrastructure appropriate ONLY in Flood Zone C areas. See Chapter 3 for further analysis.

Figure 2.9 Flood Data River Brosna – Development Site



2.2.7 Ancillary Effects

Additional factors were taken into consideration when designating areas suitable for wind development across the County including: population density, heritage sites, tourism initiatives and local transport infrastructure. In local terms the following additional factors are considerable and unique determinants in the unsuitability of this site:

1. **Population Density :** The proposed site has 216 households within 2km and 312 within 3km. A number of large towns and villages are in close proximity; Birr, Shinrone, Carrig and Riverstown. Given the topography of the area (high elevation above and around the proposed development) there is an absence of existing and potential screening such that the full development is visible from the higher population centres of Birr and Carrig and partially visible from the village of Shinrone. This results in a disproportionate landscape and visual impact. See Chapter 7.
2. **Birr Castle and Demesne Observatory:** On 18 April 2025 the Irish Government added the Birr Castle and Demesne Observatory as part of the *Historic Astronomical Observatories of Ireland* to its UNESCO Tentative List, marking the first formal step towards full World Heritage nomination. The Minister for Housing, Local Government and Heritage described the designation as a significant milestone in recognising Ireland's contribution to global scientific heritage, consistent with the Government's *Strategy for World Heritage in Ireland 2025–2035*. In addition to its historic significance, Birr Castle Demesne hosts an I-LOFAR station, forming part of the wider European LOFAR radio astronomy network. Funded in part by Science Foundation Ireland, the facility is located at Birr in recognition of the demesne's relatively radio-quiet environment, a critical requirement for sensitive radio astronomy observations, further reinforcing the site's contemporary scientific importance alongside its heritage value and the need to protect the area from noise interference. The Birr Local Area Plan 2023–2029 identifies Birr Castle and the UNESCO status as a key strategic objective. The County Development plan recommends protection from interference within a 5km radius of the Castle. This development sits at the edge of this radius.
3. **Birr Airfield:** ACP in pre-planning consultation noted twice the potential impact and effect of a Windfarm on the local IAA licensed Airfield in this location. Birr Aerodrome is an Irish Aviation Authority approved Designated Training Organisation delivering Private Pilot Licence training to EASA standards. The proposed development overlaps directly with the Airfield and Flying club activities. See Chapter 11.
4. **The River Brosna** is presented in the application as a buffer or perimeter to the development. This fundamentally undermines and misrepresents the importance and

sensitivity of this river corridor. The River Brosna is a highly protected hydrological and ecological system supporting aquatic habitats, bird movement and feeding corridors, and wider biodiversity connectivity across the landscape. It is also a major recreational and community amenity relied upon by angling groups from Templemore, Shinrone, and Birr. It serves as a unique resource to the local Outdoor Education Centre whose programmes and activities depend directly on access to this environment. The extent to which the development threatens not only ecological integrity, but also the established recreational, educational, and social value of the river corridor cannot be overstated. See Chapter 3, 11.

2.3 RWE Site Selection Process

The Applicant RWE in an online brochure designed to communicate and promote their scoping process with local communities described the steps they take to identify appropriate sites for their wind energy developments (2025/6). See Figure 2.10 below taken directly from the RWE website/castlegarden brochure as part of their consultation programme. This information is still active on the website as of May 2026.

Figure 2.10



<https://ie.rwe.com/-/media/RWE/RWE-Ireland/downloads/castlegarden/castlegarden-brochure.pdf>

The Applicant acknowledges the centrality of the Local development plan and the requirement to protect or shield Natura 2000 sites in the following points;

Point 2: *Review the County Development Plan to clarify those areas which have been zoned strategically for wind development by the County Council/local planning authority in conjunction with the plan prepare an evaluation of the landscape and its sensitivity for wind energy developments.*

Point 4: *Any Natura 2000 Sites or national environmentally designated sites in the area are identified and avoided.*

Further, the Applicant early in their consultation process were cautioned by the ACP Planning Inspector about the designated status of the site. At a meeting between An Bord Pleanála and the Applicant, representatives for the Board noted that *"It would appear from the Wind Energy Policy pertaining to the site that the proposed development*

may constitute a material contravention of both development plans. (Offaly & Tipperary) and advised the applicant to provide a detailed planning statement addressing this consideration." In further correspondence, the Inspectors Report ABO 318666-23, dated 15th September 2025, Page 9 states that *"The site appears to be in an area identified as not suitable for wind energy development in both the Offaly and Tipperary County Development Plans. This may represent a significant issue, considering recent legal case law regarding the primacy of the Development Plan."*

2.3.1 Alternative Site Analysis

In their Submission the Applicant reveals the rationale underpinning their site selection and the process they followed in determining Ballincor as a suitable development site. The screening exercise was conducted **in 2018**—eight years before this planning application was submitted. No update, refresh, or re-run of the screening is documented. There is no statement that the 2018 data or outputs remain valid at the time of application. Across the 8 years many aspects of the Site and its environs have changed or evolved. The area has become subject to a range of restoration and rehabilitation programmes from various government programmes and agencies. Notwithstanding, the Applicant identifies the following screening criteria:

1. Available wind resource
2. Environmental constraints, including potential impacts on Natura 2000 and nationally designated sites (SAC, SPA, NHA, pNHA)
3. Population density
4. Proximity to dwellings
5. Planning policy compliance
6. Archaeological features
7. Landscape and visual constraints
8. Proximity and access to the national electricity grid
9. Access route availability
10. Land ownership and title constraints

11. Availability of sufficient unconstrained land to accommodate turbine spacing and overall wind farm layout requirements

A credible and transparent site selection exercise should involve a structured comparative assessment similar to the matrix illustrated below in Figure 2.11 (taken from another developer application for demonstrative purposes).

Figure 2.11: Sample Site Selection Matrix

Environmental Impact Assessment Report
Brittas Wind Farm

MWP

Table 4-1: Alternative Sites Environmental & Policy Comparison

Environmental/Policy Criteria	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6
Landscape & Visual Effects	3 – Flat site - No landscape designation	2 – Upland Secondary Amenity Area	1 – Upland Primary Amenity Area	2 – Secondary Amenity Area	1 – Upland Primary Amenity Area	1 – Upland Primary Amenity Area
Wind Speed	3 – Good average wind speed	5 – High average wind speed	4 – good average wind speed varying across the site	5 – high average wind speed	2 – low average wind speed varying across the site	4 – good average wind speed varying across the site
Habitat Sensitivity	5 – No sensitive habitat identified	3 – Some sensitive habitat identified – Alpine heath	2 – Sensitive habitat identified – Alpine & wet heath	4 – Some sensitive habitat identified – Alpine heath	4 – Some sensitive habitat identified – Alpine heath	3 – Sensitive habitat identified – Dry heath
Proximity to Designated Sites	4 – In proximity to Lower River Suir SAC	3 – In proximity to Kilduff, Devilsbit Mountain SAC	4 – Proximity to Lough Derg SPA	4 – Proximity to Slievefelim to Silvermines Mountains SPA	4 – In proximity to Lower River Suir SAC	1 – Adjacent Galtee Mountain SAC
Proximity to National Grid	5 – Close proximity to Thurles 110kV substation	4 – Medium proximity to Ikerrin 110kV substation	4 – Medium proximity to Nenagh 110kV substation	4 – Medium proximity to Nenagh 110kV substation	4 – Medium proximity to Doon 110kV substation	5 – Close proximity to Cahir 110kV substation
Wind Energy Policy	5 – Open to consideration	1 – Unsuitable for new wind energy development	1 – Unsuitable for new wind energy development	1 – Unsuitable for new wind energy development	1 – Unsuitable for new wind energy development	1 – Unsuitable for new wind energy development
Heritage & Tourism Effects	5 – No significant heritage or tourism receptors	4 – Amenity Trails on site	1 – Amenity Trail on site and proximity to Lough Derg	4 – Amenity Trails on site	5 – No significant heritage or tourism receptors	3 – Amenity Trail on site and proximity to Galtee Mountains
Flooding	2 – Flooding identified on site	5 – No flooding identified on site	5 – No flooding identified on site	5 – No flooding identified on site	5 – No flooding identified on site	5 – No flooding identified on site
Delivery Access	5 – Close proximity to national road network	4 – Medium proximity to national road network	2 – Constrained access to regional road network	5 – close proximity to regional road network	4 – Medium proximity to regional road network	5 – Close proximity to national road network
Aviation	5 – No airports in proximity	3 – Within military restriction zone	3 – Within military restriction zone	4 – Partly in military restriction zone	5 – No airports in proximity	3 – Within military restriction zone
TOTAL SCORE	42	34	27	38	35	31

Ch 04 Alternatives

4-1

Nov 2024

Such an approach establishes a logical and evidence-based framework through the use of weighting, scoring, and comparative ranking to objectively justify the selection of one site over another.

By contrast, the approach presented by the Applicant amounts to little more than a generic checklist comprised largely of developer-led considerations relating to commercial viability and technical deliverability, supplemented by a broad environmental constraint filter.

There is no scoring matrix, no weighting system, no disclosure of how a site that performed well on criterion 1 but poorly on criterion 3 was assessed relative to another site. The eleven criteria are presented as a list with no methodology for how they interacted or determined outcomes. Although four alternative sites are named there is

no comparative analysis and no ranking process. In fact the Applicant has pursued ALL available sites:

Fahybeg, County Clare — planning application submitted and granted

Shancloon, County Galway — planning application submitted

Muingmore, County Mayo — planning application submitted

Clooncunny, County Sligo — active pre-planning stages with ACP.

The EIAR does not present an alternative site analysis in any meaningful sense. What the Applicant describes as a site selection process is, in substance, a portfolio development exercise: the 2018 screening identified a number of sites across Ireland, and rather than selecting one preferred location over others, the Applicant has pursued all of them.

The EIAR effectively concedes this, noting that the alternatives comparison for each site "is provided in the EIAR accompanying the planning application for each project." There is therefore no exercise in which Ballincor was weighed against and preferred over alternative locations, all viable sites were pursued simultaneously. The logical consequence is that Ballincor was not chosen because it was the best option; it was chosen because it was available. This is a commercial land-banking strategy, not a reasoned selection of a preferred site and it cannot satisfy the requirement under the EIA Directive and EPA Guidelines to demonstrate that the chosen option was selected on the basis of a comparative assessment of its environmental effects relative to reasonable alternatives.

By contrast, Offaly County Council undertook a far more rigorous and transparent assessment process through the preparation of its Wind Energy Strategy and associated sieve mapping exercise. That process systematically evaluated constraints and sensitivities across the county in order to objectively determine which areas were suitable, less suitable, or unsuitable for wind energy development. The County Development Plan designation therefore represents the outcome of a strategic, evidence-based planning exercise carried out in the public interest, rather than a developer-led site selection exercise driven primarily by project deliverability.

2.4 ACP Precedent and Position

2.4.1 CDP primacy in Application assessment

An Comisiun Pleanála has heretofore respected and protected the role of the County Development Plan. On January 15th 2025 An Bord Pleanála made a statement on renewable energy decisions:

"In 2023 and 2024, 30 decisions were made on normal planning appeals relating to wind farm applications..... 15 of these were refused, nine of which were refused for multiple reasons while six were refused for a single reason relating to local Development Plan policy".

Appendix 2-2 sets out the inspector recommendations in three of those refusals as it pertains to CDP. Three features of those decisions establish a consistent pattern of reasoning that is directly applicable to the Ballincor application.

In each refusal the planning authority's spatial designation — whether expressed as an Exclusion Zone on a Wind Energy Strategy map (Waterford) or as a High Value Landscape under a Landscape Character Assessment (Cork) — was treated as determinative of site suitability. The Offaly and Tipperary County Development Plans designate Ballincor as Not Suitable through the equivalent statutory mechanism: a Wind Energy Strategy and sieve-mapping exercise.

In each decision the Inspector expressly weighed the renewable energy benefits and found them insufficient to displace the plan-led designation; the Coumnagappul and Dyrick Hill recommendations are explicit on this point — "notwithstanding the benefits of renewable energy proposals and the policy support otherwise."

Each refusal was grounded in the statutory test under section 34(2)(a) of the Planning and Development Act 2000 — that the development was "contrary to the proper planning and sustainable development of the area", which is the same test An Coimisiún Pleanála must apply to the Ballincor application.

On the facts, the Ballincor application is a stronger case for refusal than each of the three precedents. It contravenes not one County Development Plan but two, Offaly and Tipperary. It engages not a single constraint such as an Exclusion Zone or a High Value Landscape, but the full spectrum of the Wind Energy Strategy sieve criteria and it has been flagged by An Coimisiún Pleanála's own Inspector at the pre-application

stage as raising a material contravention concern in respect of both County Development Plans (Inspector's Report ABP-318666-23, 15 September 2025, p.9).

2.4.2 Joint Committee Meeting on Climate, Environment and Energy

At a recent **Joint Committee Meeting on Climate, Environment and Energy** (on the delivery challenges in the Offshore Wind Sector) 26th Nov 2025 the Chief Executive Officer ACP Peter Mullins and the Director of Planning ACP Ciara Kellett were asked to clarify ACPs position on the County Development Plan. See Appendix 2-3 for full context and transcript.

Below is a video link and quotes taken from the public transcript.



Video link 1.44:48

https://www.oireachtas.ie/en/debates/debate/joint_committee_on_climate_environment_and_energy/2025-11-26/

The discussion centred on the role of the Designated Maritime Area Plan (DMAP) as a statutory spatial planning framework for offshore wind and its clear parallel with County Development Plans in the onshore context. Deputy John Clendennen TD sought clarification from An Coimisiún Pleanála as to whether DMAP zones—like County Development Plan zoning—are intended to define where development should and should not occur and whether the Board would depart from such designations. In response, Peter Mullins emphasised the importance of the question and deferred to planning expertise within the organisation, noting:

“Now, that’s an important question, Deputy... I’m not a planner...” at which point he deferred to his Director of Planning, Ciara Kellett.

Ciara Kellett Director of Planning then confirmed the structured and plan-led nature of DMAP designations, drawing a direct comparison with County Development Plans and stating:

"These sites have been identified... they have already gone through a process... so it would be very strange for us to find something there that would mean we go outside of the areas that have been identified."

The exchange establishes a clear and authoritative acknowledgment that both offshore (DMAP) and onshore (County Development Plan) frameworks are the product of rigorous spatial planning processes and are intended to guide, and constrain, development within designated areas.

2.5 The Legal Status of the County Development Plan & Climate Action Plan Obligations

An Comisiún Pleanála from its Leadership to Planning Inspectors has consistently supported the role of the County Development plan, its Wind Energy Strategy and areas of designation therein all of which requires refusal in this case. However, as a community group we acknowledge that Wind energy developers have repeatedly sought to narrow or displace the Board's discretion, arguing that national climate policy should take precedence over local planning frameworks and zoning designations. Indeed the Applicant invokes these arguments to justify their contravention of the County Development Plan in their Submission.

That tension, between plan-led development and policy-driven urgency has given rise to a series of High Court judicial reviews culminating in a Supreme Court decision of acknowledged systemic importance. The judgement in *Coolglass Wind Farm Limited v An Coimisiún Pleanála* [2026] IESC 5 (delivered 4 February 2026) provides critical legal clarity on the hierarchy of planning instruments, the role of County Development Plans and the extent to which climate objectives can influence, but not override, statutory planning obligations

The Applicant draws on this judgement to support their position but their interpretation is misguided and selective. They are correct on one narrow point, the Commission cannot treat material contravention as a self-reinforcing reason for refusal without engaging with the climate benefits. But they have confused the reason the original Coolglass refusal was quashed with an obligation to grant permission.

The following is a deep analysis of *Coolglass Wind Farm Limited v An Coimisiún Pleanála* [2026]. It is structured around four sequential and independent legal positions. Each position stands alone; together they are mutually reinforcing and constitute a comprehensive, layered and Supreme Court-proof case for refusal.

Throughout, references are given directly to paragraph numbers of the primary text of *Coolglass Wind Farm Limited v An Coimisiún Pleanála* [2026]. This is essential: we believe the judgment has been widely mischaracterised both by those who say it requires permission for all wind farms and by those who say it simply restores CDP primacy without qualification. **This submission applies it precisely as written and in**

the Ballincor application context. A review of the Applicant's interpretation of the judgement will follow.

2.5.1. The Plan-Led System in Irish Law

The County Development Plan is the cornerstone of the Irish planning system. Its statutory primacy is established by **Section 9(1) of the Planning and Development Act 2000 (as amended)**, which requires every planning authority to make a Development Plan for the development and use of land in its area. Section 34(2)(a) restricts An Coimisiún Pleanála ("ACP") in every determination to consider *"the proper planning and sustainable development of the area."* The Supreme Court confirmed this architecture in *Coolglass* at paragraph 96:

"Section 34(2)(a) provides that when making its decision a planning authority 'shall be restricted to considering the proper planning and sustainable development of the area' having regard to a number of matters including guidelines issued by the Minister under s. 28, and where relevant the policy of the Government..." — *Coolglass* [2026] IESC 5, §96

The Supreme Court went further at paragraph 91, making a point that is **directly applicable to this case** and that this submission places at the very centre of its argument:

"The designation of an area in a County Development Plan as open to wind farm development or not, is itself an exercise of proper planning and sustainable development." — *Coolglass* [2026] IESC 5, §91 (**emphasis added**)

The Offaly CDP's designation of Ballincor as 'Not Suitable' is therefore not an obstacle to proper planning — it is an expression of it. This single sentence from the Supreme Court disposes of the developer's central argument before it is made.

Section 37(2)(b) PDA 2000 provides that ACP shall not grant permission for development that would materially contravene the Development Plan unless it is

satisfied that the development is of strategic or national importance, or that exceptional and compelling circumstances apply. Neither test is met by the Ballincor application. It is a commercially motivated application on a site designated 'Not Suitable' in a county already exceeding national renewable energy targets.

The Irish courts have described the Development Plan as an "*environmental contract*" between the planning authority, elected members and the public (*Tristor Ltd v Minister for the Environment* [2010] IEHC 397). Departures must be exceptional and justified by considerations of overriding significance (*Byrne v Wicklow County Council* [1994] IEHC 12). The Supreme Court reinforced the integrity of the Development Plan system in *Coolglass* at paragraph 129:

"The existence of the OPR is a safeguard to ensure that the development plan is properly aligned with both government policy and legislative requirements, and it underscores the importance of the development plan in the overall planning system." — *Coolglass* [2026] IESC 5, §129

ACP has itself refused wind energy applications in CDP exclusion zones: ABP-318446-23 (Counagappul), ABP-317809-23 (Coolglass, first refusal), ABP-317240-23 (Shronagree), ABP-317265-23 (Dyrick Hill). Consistency in administrative decision-making is a principle of lawful governance. There is no basis for treating the Offaly CDP exclusion zone differently.

2.5.2 The Offaly Wind Energy Strategy: A Statutory Evidence-based Instrument

The Offaly CDP 2021–2027 Wind Energy Strategy was produced through a statutory plan-making process: subject to Strategic Environmental Assessment (SEA) and Appropriate Assessment (AA), adopted by elected members following public consultation, and reviewed by the OPR without adverse intervention. The OPR's non-intervention is a material consideration — the Supreme Court confirmed at paragraphs 129–130 of *Coolglass* that the OPR's review and non-intervention is a relevant and legitimate factor for ACP to weigh.

The Strategy employed a step-by-step sieve mapping methodology as recommended by the EMRA RSES 2019–2031. Every criterion points in the same direction for Ballincor:

Table 2.5 Suitability Criteria and Outcome

Wind speed	FAIL: Below the >7.5 m/s threshold at 100m hub height. Designated in the lowest wind category in the county.
Grid access	FAIL: No transmission infrastructure in proximity. Proposed connection at Dallow 110kV — a documented constrained interface with rising curtailment and over 12km of grid connection cabling through villages, towns, passing schools. 50 week rolling trenching programme minimum.
Landscape	FAIL: Classified HIGH Moderate scenic sensitivity in County Landscape Character Assessment. Exclusion required per National Landscape Strategy 2015–2025.
Designated sites	FAIL: Adjacent to Sharavogue Bog SAC. Close proximity to River Brosna SPA and Shinrone NHA. Habitats Directive exclusion applies.
Flood risk	FAIL: Area prone to recurring flooding. River Brosna hydrological corridor.
Housing density	FAIL: 216 households within 2km. Birr, Shinrone, Carrig, Riverstown in close proximity.
Heritage & amenity	FAIL: Birr Castle UNESCO Tentative List (April 2025). I-LOFAR Radio Quiet Zone. Birr Heritage Town. Designated scenic routes. Fishing clubs and Outdoor Education Centre usage

The conclusion of the Strategy is unambiguous: the Ballincor area is *"generally unsuitable for wind farm development due to significant environmental, heritage and landscape constraints and housing density."* This conclusion was reached across **every**

single dimension of the sieve analysis. It is not an arbitrary exclusion. It is the product of structured statutory assessment, independently verified through SEA and AA, and is consistent with the positions of both Offaly **and** Tipperary County Councils.

2.5.3. Climate Action Obligations and Section 15(1)

Windfarm developers have increasingly argued that Section 15(1) of the Climate Action and Low Carbon Development Act 2015 (as amended in 2021) creates an overriding obligation to approve renewable energy projects. The Applicant specifically has drawn on this argument in their submission. The developer presents Ireland's renewable energy shortfall as a near-automatic justification for approving every shovel-ready wind project. The 4GW gap is real. The urgency of meeting the 9GW target is not disputed. What is disputed is the leap from national urgency to site-specific permission. National targets are aggregate objectives, not site-specific mandates.

The High Court held that Section 15(1) created, in practice, a requirement to 'almost always' grant permission for renewable energy projects. The Supreme Court firmly and unambiguously rejected this at paragraph 84:

The Supreme Court addressed this directly in *Coolglass*.

*"The question of consistency of an individual planning decision with the s. 15(1) objectives, is **much more complex than a traffic light system** of climate friendly (go) (unless impracticable) and climate unfriendly (stop)."* — [2026] IESC 5, §84

The Court went further at paragraph 87, constructing a hypothetical that **maps almost precisely onto the Ballincor situation**. This is the single most important passage in the judgment for this submission:

The Supreme Court's Own Hypothetical — Paragraph 87:

"Assume that a particular County Council had designated an entire County as open to wind farm development other than only 10 hectares of high scenic, cultural and amenity value. If we then assume that multiple wind farm developments have already been approved in respect of that County, but an application is subsequently made for permission for a wind farm development in

respect of the reserved scenic area. On the approach urged by Coolglass, adopted by the High Court, it appears that permission would nevertheless have to be granted..."

*"This however would **make a nonsense of the elaborate structure established by the 2015 and 2021 Acts**, especially when superimposed on the already detailed and nuanced planning regime created by the Planning and Development Act 2000 (as amended)."*

— [2026] IESC 5, §87 (**emphasis added**)

This hypothetical was constructed by the Supreme Court itself, deliberately, to demonstrate that climate policy cannot override a CDP protected area in a county that has already delivered extensively on renewables. Offaly has delivered 25% of Eastern Region wind output from 2% of land area. Multiple wind farms are operating and permitted. The Ballincor site is precisely that 'last protected area' — achieving the county's highest scenic sensitivity status, SAC-adjacent, flood-prone, poorly-served by the grid, and failing every single sieve-mapping criterion. The Court's own words, in the Court's own hypothetical, reject this application.

2.5.4. Compliance with a Climate-Aligned Development Plan

At paragraph 108, the Court described Section 15(1) as a 'climate sense check' — importantly, this is the Court's own phrase, not a characterisation introduced by this submission:

*"It applies to the functions of all relevant bodies, and obliges such bodies to exercise those functions consistently with the climate objectives so far as possible. **This operates as a form of climate sense check**, and to ensure that decisions and actions of public sector bodies are all aligned with the climate objectives. The section 15(1) obligation is not more prescriptive than that..."* — [2026] IESC 5, §108 (**emphasis added**)

The Court confirmed at paragraph 109 that Section 15(1) is *"perhaps less likely"* to have decisive effect in the planning field than in respect of other public sector bodies, *"because considerations of climate change mitigation are already woven into the detail of the planning code."*

The Supreme Court further confirmed that compliance with a Development Plan that is itself climate-aligned will normally satisfy section 15 obligations:

"A planning authority is entitled to commence into consideration with a presumption that compliance with the development plan will itself be compliant with its s. 15(1) duty."

And critically:

"If in such a case, the development plan is itself consistent with the climate objectives set out in s. 15(1), then it will normally be the case that a decision which complies with that plan will itself be consistent with those objectives."

Also

*"If... the development plan is itself consistent with the climate objectives... then... **a decision which complies with that plan will itself be consistent with those objectives.**"*

The Offaly CDP is precisely such an instrument — SEA'd, AA'd, OPR-reviewed and climate-consistent. Climate law does not need to intervene because it is already embedded in the plan. In other words, spatial zoning decisions within the CDP are themselves expressions of sustainable and climate-consistent planning. The Ballincor site is designated as "Not Suitable" for wind energy development in both Offaly and Tipperary County Development Plans. That designation was reached following:

- Step-by-step sieve mapping,
- SEA and AA assessment,
- Evaluation of wind speeds and grid access,
- Landscape character analysis,

- Natura 2000 screening,
- Flood risk considerations,
- Settlement pattern assessment.

This is not an arbitrary exclusion. It is the product of structured statutory analysis. Offaly has demonstrably delivered renewable energy infrastructure at a rate exceeding almost ALL other counties in Ireland and certainly ALL other counties in its region, within this statutory framework. There is therefore no systemic failure in Offaly's contribution to national climate objectives. Under the Supreme Court's reasoning in *Coolglass*, a decision upholding such a designation:

- Engages with climate law,
- Respects the statutory framework,
- Preserves planning integrity,
- Remains consistent with Section 15(1).

2.5.5 The Three Narrow Exceptions: None Applies to Ballincor

The Court acknowledged at paragraph 113 that in certain narrow, exceptional circumstances, Section 15(1) might justify material contravention despite a CDP exclusion. Three exceptions were identified. **None applies to Ballincor.**

Table 2.6 Review of 3 Narrow Exceptions

1. The Development Plan is not climate-compliant	The Offaly CDP 2021–2027 was produced after the 2021 Climate Act amendments. It was SEA'd, AA'd and OPR-reviewed. The Minister has confirmed it discharges RED III Article 15b obligations. It is current and demonstrably climate-aligned. <u>This exception does not arise.</u>
2. The Development Plan no longer complies due to changed climate	National renewable targets have not changed to make the Offaly exclusion zone obsolete. Offaly's already-exceptional delivery record makes the exclusion zone more justified now than when the

objectives	CDP was adopted. <u>This exception does not arise.</u>
3. The development is at the border of an excluded area and the protected values are not particularly engaged	Ballincor is not at the border of a designation. It is firmly within it. The site engages every single value the exclusion was designed to protect: high landscape sensitivity, SAC adjacency, SPA proximity, flood risk, housing density, heritage. This exception could not be more remote from the facts. <u>This exception does not arise.</u>

Because none of the three exceptions arises, ACP is entitled under paragraph 112 to presume that compliance with the Offaly CDP satisfies Section 15(1). The presumption of climate-compliance stands and cannot be rebutted.

2.6 The RWE Argument

The Applicant's case for permission rests on five sequential arguments, assembled to look like a chain of logic. They are presented as a cascade — each step reinforcing the last, until refusal appears almost unreasonable. But the chain does not hold. The first argument identifies a discretion but mistakes it for a mandate. The second invokes genuine national urgency but misapplies it to the wrong site. The third selectively reads a Supreme Court judgment that, properly understood, cuts directly against this application. The fourth rests on a factual claim about the CDP that is simply incorrect and the fifth confuses measuring impacts in isolation with a holistic assessment of site suitability — which the CDP has already. A review of each below dismantles their argument.

1. ***Section 37G(6) provides the mechanism to override the CDP***

The developer is correct that Section 37G(6) gives An Coimisiún Pleanála the power to grant permission in material contravention of a development plan, and that for Strategic Infrastructure Development this power carries no statutory preconditions. That is not disputed.

What the developer does not acknowledge is that the existence of a power is not in itself a justification for its exercise. Section 37G(6) is a discretion. The Commission *may* grant permission, not must. The question of whether that discretion should be exercised is the entire issue in this case and it cannot be answered simply by pointing to the provision that creates it. The developer has identified the mechanism. They have not justified its use. That justification is attempted through the propositions that follow, each of which fails for the reasons set out below.

2. ***Climate urgency — Ireland's 4GW shortfall — justifies using it***

The developer presents Ireland's renewable energy shortfall as a near-automatic justification for approving every shovel-ready wind project. National targets are aggregate objectives, not site-specific mandates. As previously discussed SEAI data confirms that many counties each generate zero megawatt-hours of onshore wind energy despite the requirement to offer designated suitable areas within their own development plans. The Applicant has pursued and is pursuing these sites in other

counties in Ireland. The Supreme Court Coolglass judgement reinforces the argument that national targets are not site-specific mandates, particularly in those counties that are delivering.

3. ***Coolglass obliges the Commission to weigh the climate case before refusing***

The developer reads the Coolglass judgment selectively. The Supreme Court explicitly and specifically rejected the broader argument the developer is trying to make here. At paragraph 84, the Court stated that consistency with climate objectives "is much more complex than a traffic light system of climate friendly (go) (unless impracticable) and climate unfriendly (stop)." At paragraph 115, it held that the Section 15 duty "cannot be converted into a simple formula" of the kind the developer advances. The developer's Planning Statement closely mirrors the High Court reasoning in Coolglass, the reasoning the Supreme Court expressly overturned. The most important passage in the entire judgment for this application is paragraph 87, which the developer does not cite anywhere. The Court constructed a deliberate hypothetical: a county where almost all land is open for wind development, multiple farms are already approved, and an application is made for the last protected area of scenic and amenity value. The Court said granting permission in that scenario "would make a nonsense of the elaborate structure" of the planning system. This describes Offaly and Ballincor precisely. Offaly provides 28% landmass to wind-energy developments, generates 11% of national renewable electricity from 2% of national land area, 25% of the Eastern regions delivery to day, has a future pipeline exceeding 1GW within designated areas, and Ballincor is a protected landscape. The paragraph 87 test, applied here, runs directly against the developer.

What the Commission must do and what this objection supports, is to engage genuinely with the climate benefit question as Coolglass requires. When it does so properly, the answer is refusal.

This site is classified as High-Moderate Scenic Sensitivity. It supports a documented range of protected species and has been identified as a site of exceptional ornithological value. The Little Brosna River, chosen by the developer as their eastern site perimeter, is not a boundary — it is a designated habitat in its own right, a hydrological corridor connecting multiple Natura 2000 SACs, a critical passage for Annex I species, and a watercourse already classified as Poor status and High Risk.

The underlying geology is constrained and unstable. The area surrounding the site is heavily populated and the number of homes within 2km is substantial. The site is flanked by elevated ground on both sides, eliminating any natural screening and creating the precise topographical conditions under which visual impact, shadow flicker, and noise propagation are most likely to breach acceptable limits.

These constraints were identified in the CDP sieve-mapping exercise. Not one has been removed, resolved, or materially mitigated by anything in the developer's application. Worse, the development as proposed recommends four of the eleven turbines to be constructed in a functional floodplain creating a whole host of new problems.

This development imposes greater environmental cost not less. The same climate benefit is available at alternative sites in other areas. Refusal, on these facts, is not circular reasoning. It is the substantive engagement the Supreme Court required.

4. *The CDP designations are outdated and no longer climate-consistent*

This is the developer's most aggressive claim and the one most directly contradicted by the facts.

First, the factual premise is wrong: The Offaly CDP came into effect on 22 October 2021 — after the Climate Action and Low Carbon Development (Amendment) Act 2021, the very legislation the developer invokes. It was made under the same climate framework. The developer's claim that it predates current climate planning is simply factually incorrect. CAP24 and CAP25 post-date the CDP as annual updates under the same legislative framework. They are not statutory land-use instruments, they do not amend the Planning Acts, redesignate unsuitable lands or override County Development Plans.

Second, the OPR non-intervention stands *against* not *for* the argument: The Office of the Planning Regulator reviewed the CDP without adverse intervention on the wind energy designation. The Supreme Court at paragraph 129 confirmed that OPR non-intervention is a proper and relevant consideration for the Commission. It is evidence that the CDP is properly aligned with national policy. The developer's argument requires demonstrating the OPR was wrong not to intervene. No such case is made.

Third, as previously presented in Table 2.6 none of the three Coolglass exceptions is established: The Supreme Court at paragraph 112 establishes that the Commission is

entitled to presume that compliance with a CDP satisfies its Section 15 duty. At paragraph 113 it identifies three narrow exceptions where that presumption can be displaced. The developer has not established any of them: the CDP is climate-aligned on its face, embedding CAEP-37 and CAEO-03; it postdates the current legislative framework; and Ballincor is not at the margins of the designated area — it failed every single criterion of the sieve-mapping analysis. The presumption stands unrebutted. The CDP designation is not pre-climate-era policy. It is the product of a planning process that engaged directly with climate objectives and weighed them against environmental, landscape, and heritage constraints. The "Not Suitable" designation is not a failure of climate alignment — it is what climate-consistent planning looks like.

5. *Technical compliance removes any remaining environmental objection*

That assertion is disputed in full. This community submission will address each of those technical strands; hydrology and flood risk, hydrogeology and peat stability, ornithology, habitat protection and ecology, visual impact, noise thresholds and shadow flicker. Each will present the Applicants case as either inaccurate, incomplete or reliant on mitigation that cannot cure the underlying unsuitability of the site. Site suitability is a holistic judgment and a judgement the CDP has already made.

2.6.1 The RED III Argument is Self-Defeating

One final point cuts across all five propositions. The developer invokes RED III as a source of accelerated permitting rights and a presumption of overriding public interest. Article 15b of RED III requires Member States to map areas suitable for renewable energy development. Ireland fulfilled this obligation by collating CDP designations from all 31 local authorities into a national map submitted to the European Commission. The developer seeks to rely on Directive (EU) 2023/2413 ("RED III") to support both an accelerated permitting process and a presumption that the proposed development is of overriding public interest (IROPI). However, the application of RED III in this manner is fundamentally misrepresented.

RED III does not displace the plan-led system of development which underpins Irish planning law. Rather, it reinforces it. Article 15b of the Directive requires Member States

to undertake spatial mapping to identify areas suitable for renewable energy development.

Confirmed by Ministerial response to Parliamentary Question 164, 4 November 2025, presented in Appendix 2-1, Ireland has fulfilled this obligation through the County Development Plan system, including the Wind Energy Strategy and associated designation mapping. The Offaly County Development Plan, which designates Ballincor as "Not Suitable", forms part of Ireland's national territorial mapping submitted to the European Commission under RED III.

The legal consequence is clear and unavoidable. The exclusion of Ballincor is not a local policy preference capable of being set aside in an individual application. It is part of the State's EU law compliance framework. To grant permission for development in this location would directly contradict the spatial strategy submitted by Ireland under RED III and would undermine the integrity of that framework.

Furthermore, the presumption of overriding public interest does not eliminate the requirement to demonstrate appropriate site selection. RED III does not authorise development in unsuitable locations where suitable alternatives exist. On the contrary, it presupposes that development will occur within areas identified as suitable through a structured and evidence-based process. The evidence set out in this chapter demonstrates that multiple suitable alternatives exist within designated areas of County Offaly and the wider region, while Ballincor fails across every criterion of the statutory sieve-mapping exercise. Offaly County Council has identified its capacity to meet and exceed renewable targets up to 2032 but within designated areas. Other counties within the region and across the country have failed to do so.

In these circumstances, the applicant's reliance on RED III is not only misplaced but self-defeating. The Directive, properly interpreted, reinforces the primacy of the Development Plan and the necessity of appropriate site selection. It provides no basis for departing from the clear designation of this site as unsuitable.

Finally, while RED III introduces procedural timelines, it does not dilute the legal standard applicable to planning decisions. An Coimisiún Pleanála remains bound to determine the application in accordance with the proper planning and sustainable development of the area, grounded in law and evidence. As confirmed by the Supreme Court in Coolglass, policy objectives, including climate policy, cannot override that statutory obligation.

2.7 Summary of the Arguments

The Board is tasked in this case with navigating a dense and at times, competing framework of national policy, EU and domestic directives, statutory regulations, technical guidance, environmental principles and an evolving body of case law. However, complexity does not dilute clarity.

When the relevant provisions are properly aligned and assessed cumulatively—across policy, law, environmental protection, and proper planning principles—the outcome in this case is not finely balanced. On each and every determinative issue, the proposed Ballincor Wind Farm conflicts with the governing framework.

The THREE Positions below act as a summary of the many issues that have been presented heretofore.

POSITION 1 — CDP PRIMACY

The Offaly CDP is climate-aligned, SEA'd, AA'd, OPR-reviewed and delivering. Under *Coolglass* §112, compliance with it satisfies Section 15(1). The presumption of climate-compliance is triggered and cannot be rebutted. ACP should refuse.

This position rests on five independent pillars:

Pillar 1 — The CDP is climate-aligned and OPR-approved

The Offaly CDP was made after the 2021 Climate Act amendments, which require Development Plans to include objectives relating to greenhouse gas reduction and climate adaptation (s.10(2)(n) PDA 2000, as amended). It was SEA'd, AA'd and reviewed by the OPR without adverse intervention. Under *Coolglass* §112, these facts are sufficient to trigger the presumption. As the Court confirmed at §118(viii), establishing consistency with Section 15(1) should be "*not a difficult matter*" when the decision is consistent with a plan itself prepared under the Section 15(1) obligation.

Pillar 2 — Offaly is demonstrably delivering: no systemic failure

A key background in *Coolglass* was whether Laois's planning framework was producing sufficient renewable output. Offaly presents the opposite situation. It generates 11% of national renewable electricity from 2% of national land area. The Supreme Court's own hypothetical at §87 — multiple wind farms already approved, with only a small protected area remaining — **is not hypothetical for Offaly. It is Offaly's actual situation.**

Pillar 3 — The CDP is the expression of proper planning and sustainable development

The Supreme Court confirmed at §91 that designating an area in a CDP as not suitable for wind farm development is itself an exercise of proper planning and sustainable development. ACP is statutorily restricted under s.34(2)(a) PDA 2000 to considering proper planning and sustainable development (confirmed at *Coolglass* §96). Compliance with the CDP is therefore compliance with ACP's statutory mandate.

Pillar 4 — The OPR's non-intervention reinforces the designation

The Supreme Court confirmed at §§129–130 that the OPR's non-intervention with a CDP designation is a relevant and proper consideration for ACP. The OPR reviewed the Offaly CDP and did not seek to alter the 'Not Suitable' designation for Ballincor. This is affirmative evidence that the designation is consistent with national policy and legislative requirements.

Pillar 5 — ACP's own record demands consistency

ACP's Inspector's Report on this application (ABP 318666-23, 15 September 2025) noted that *"the site appears to be in an area identified as not suitable for wind energy development in both the Offaly and Tipperary County Development Plans. This may represent a significant issue, considering recent legal case law regarding the primacy of the Development Plan."* At the Joint Oireachtas Committee (26 November 2025), ACP's

Chief Executive and Director of Planning confirmed it would be "*very strange*" to override designated spatial plan areas. ACP has refused applications in CDP exclusion zones in ABP-318446-23, ABP-317240-23 and ABP-317265-23. **Consistency requires the same outcome here.**

POSITION 2 — PRE-EMPTING s.37G(6): THE CLIMATE BENEFIT DOES NOT JUSTIFY CONTRAVENTION

Following *Coolglass*, ACP is legally required to ask whether the climate benefit justifies exercising its power under s.37G(6) to grant notwithstanding material contravention of both CDPs. The error in the original *Coolglass* refusal was not asking this question at all. This submission answers it: the climate benefit does not justify contravention.

There are four independent reasons why the climate benefit of Ballincor does not justify material contravention:

Reason 1 — The marginal climate benefit is negligible

Offaly already generates 11% of national renewable electricity from 2% of national land area. The *additional* climate benefit of approving one more wind farm on a poorly-performing wind site, with constrained grid access, in a county already saturated with renewable infrastructure, is negligible at national level. The Supreme Court at §87 expressly contemplated that where 'multiple wind farm developments have already been approved', there is no imperative to approve the last protected area. Offaly is that county. Ballincor is that protected area.

Reason 2 — The same climate benefit is available elsewhere, at lesser environmental cost

SEAI data confirms that Dublin, Kildare, Longford and Westmeath each generate **zero** MWh of wind energy. These counties have designated suitable areas in their

Development Plans that remain undeveloped. The same national climate benefit can be achieved by developing those sites, without the environmental, heritage, flood, grid and community costs of Ballincor. Where a practicable alternative exists, it is not 'practicable' to approve an environmentally constrained, SAC-adjacent site in a saturated county — as the Court confirmed at §106, 'insofar as practicable' is not a mere formality.

Reason 3 — Grid constraint materially reduces actual climate benefit

The proposed connection at Dallow 110kV connects into a documented constrained interface. National curtailment and constraint rates have risen from ~6% in 2020 to ~13–14% in 2023 and are projected to continue rising. A development whose output will be curtailed at 13–14%+ effective rates is not delivering its claimed climate benefit. ACP is required under *Coolglass* to assess the *actual* net climate benefit. Ballincor's actual net benefit is further diminished by its below-average wind speeds. A development on a designated suitable site in a zero-output county with adequate grid access would deliver materially greater climate benefit with less harm. Section 34(2)(a) PDA 2000 requires assessment of proper and *sustainable* development: a development creating stranded assets at taxpayer cost does not meet that test.

Reason 4 — Granting permission would 'make a nonsense' of the planning system

The Supreme Court's own language at §87 is decisive: if climate arguments could override a CDP designation in a county where multiple wind farms had already been approved, that would "*make a nonsense of the elaborate structure established by the 2015 and 2021 Acts.*" Offaly has delivered 11% of national renewables from 2% of land area. If s.37G(6) can be exercised here, it can be exercised anywhere, and the CDP exclusion zone system is meaningless. That is the outcome the Supreme Court explicitly and deliberately condemned.

LEGAL POSITION 3 — MANDATORY PRECLUSIONS: LEGAL

IMPRACTICABILITY

Certain legal barriers cannot be overcome by climate benefit arguments. They are mandatory preclusions. The Supreme Court accepted in *Coolglass* (§88) that legal impracticability is real impracticability for the purposes of the 'insofar as practicable' qualification. Where a mandatory legal bar exists, it is not practicable to grant permission regardless of climate benefit.

Mandatory Preclusion 1 — Habitats Directive Article 6(3)

The analysis that will follow on Hydrology, Ornithology and Biodiversity will establish, from the developer's own documents, that adverse effects on European site integrity cannot be excluded. The hydrological assessment was conducted against the wrong WFD baseline, with pollution controls that the developer's own Flood Risk Assessment confirms will fail under recurring flood conditions, and with groundwater connectivity to Sharavogue Bog SAC confirmed in the NIS but dismissed without explanation. The ornithological assessment surveyed without dawn or dusk coverage in the most critical seasons, excluded the highest-density bird activity corridor from the Collision Risk Model entirely, conducted no nocturnal, acoustic or radar surveys across nine seasons. The biodiversity assessment concludes, in the developer's own words, that the likely outcome for Marsh Fritillary is total loss of the local breeding population, while the NIS acknowledges a confirmed hydrological pathway to a priority habitat SAC and then dismisses all potential for adverse effect without any intervening analysis. Individually, each review establishes that the *Waddenzee* and *Holohan* standards have not been met. Collectively, they are conclusive. Refusal is the only lawful outcome.

Mandatory Preclusion 2 — Hydrological and Hydrogeological context

The Applicant acknowledges that the Ballincor site is a floodplain. Four turbines and significant stretches of associated infrastructure are located within Flood Zone A/B under the OPW CFRAM mapping. The Justification Test — mandatory for any

development in a flood risk zone — is not met on any of its three criteria. That alone is a substantial planning constraint. But the hydrological and hydrogeological context of this site makes the constraint something more fundamental than a conventional planning conflict.

The primary receiving watercourse — the Little Brosna_040 — is at Poor status under the WFD and At Risk of failing to achieve Good status by 2027. It is simultaneously a hydrological corridor linking the development site to Sharavogue Bog SAC, which sits within 10 metres of the site boundary and whose conservation objective is the active restoration of priority raised bog habitat. The pollution controls on which WFD and Habitats Directive compliance depends cannot function during the flood events the developer's own Flood Risk Assessment confirms will occur — the SWMP and FRA are internally irreconcilable on this point. The entire WFD compliance case was built on a Moderate baseline that is factually wrong, meaning no lawful assessment of construction-phase impacts on the actual Poor-status receiving waterbody has been made. Beneath the surface, the picture is no better: nine of twelve peat trial pits collapsed during site investigation; deep foundation excavations at T8 and T9 will penetrate saturated peat and enter soft silt to 12.8 metres depth, with groundwater flow paths of 30–300 metres in the direction of the SAC boundary, dewatering protocols undesignated and unassessed. The Supreme Court in *Coolglass* confirmed that legal impracticability is real impracticability for the purposes of the 'insofar as practicable' qualification. A site that is neither designated for wind energy nor hydrologically capable of sustaining it within the constraints EU law imposes is, in the most direct sense, not a practicable site for this development.

Mandatory Preclusion 3 — UNESCO Tentative List and I-LOFAR Radio Quiet Zone

On 18 April 2025, the Irish State formally added Birr Castle and Demesne Observatory (as part of the Historic Astronomical Observatories of Ireland) to Ireland's UNESCO World Heritage Tentative List. UNESCO Operational Guidelines (paragraphs 89–103) require that Tentative List sites and their buffer zones be protected from development that compromises their Outstanding Universal Value (OUV), setting or integrity.

The Irish Government's World Heritage Strategic Investment Fund (2026) identifies *"buffer zones protecting Outstanding Universal Value"* as a condition of funding eligibility — an implicit governmental concession of OUV buffer zone obligations. Ireland's Strategy for World Heritage 2025–2035 commits the State to ensuring Tentative List sites are protected pending formal nomination.

The State cannot simultaneously nominate Birr Castle for its landscape integrity and scientific environment, and grant permission for a development that compromises that integrity. A grant of permission inconsistent with Ireland's own World Heritage nomination process is a legally inconsistent act of public administration. The Birr Local Area Plan 2023–2029 identifies Birr Castle and UNESCO status as key strategic objectives: development adversely affecting them constitutes an additional material contravention of the Local Area Plan.

Separately, the I-LOFAR radio telescope at Birr, part of the European LOFAR network funded by Science Foundation Ireland, requires a Radio Quiet Zone (RQZ). Wind turbines generate electromagnetic interference. Turbines at Ballincor Windfarm site will fall within the operative RQZ radius. This constitutes a technical exclusion ground within EU research infrastructure dimensions, operating independently of all planning policy.

2.8 Conclusion

An Coimisiún Pleanála is respectfully requested to refuse permission for the proposed Ballincor Wind Farm on the grounds that it would materially contravene both the Offaly and Tipperary County Development Plans and would be contrary to the proper planning and sustainable development of the area.

The site is designated *Not Suitable* for wind energy in two County Development Plans, through a statutory sieve-mapping exercise it failed on every criterion. Offaly already generates 11% of national renewable electricity from 2% of the State's land area, with a pipeline exceeding 1GW within its designated areas. On these facts, a county already delivering, granting permission would, in the words of the Supreme Court in *Coolglass*, "make a nonsense of the elaborate structure" of the planning system. The marginal climate benefit is negligible and available elsewhere at lower environmental cost. Beyond the climate question, the chapters that follow will show that this site carries constraints and legal barriers the Commission has no discretion to override. Refusal is not one of several reasonable conclusions. It is the only conclusion consistent with the law, the evidence, and the statutory mandate of An Coimisiún Pleanála.

APPENDIX 8: Ornithology

Chapter 4 Ornithology

Appendix 4-1:	Dawn and Dusk Survey Coverage Analysis and Assessment
Appendix 4-2:	CRM Limitations – a List
Appendix 4-3 :	Species by Species Schedule
Appendix 4-4:	The Survey Effort
Appendix 4-5:	Cumulative Register
Appendix 4-6:	Dr Pat Moran Expert Ornithological report

Preliminary Statement on the Absence of Primary Ornithological Survey Data and the Basis of the Appendices

The ornithological assessment in Chapter 7, and the Collision Risk Model on which it depends, are the critical drivers of the entire Appropriate Assessment and impact conclusions for birds. The integrity of those conclusions rests entirely on the quality, coverage and conduct of the underlying Vantage Point (VP) surveys.

As a baseline it is important to present the following detail from Chapter 7 EIAR.

7.2.7.1.1.1 TOBIN Vantage Point Surveys

Vantage Point Surveys were carried out by TOBIN during the Winter Season 2025/2026 between (October to February), at five vantage point locations (VP1 to VP5), to further strengthen the data for the Collision Risk Model. The VP methodology followed guidelines issued by the SNH (2017). The minimum requirement of 36 hours per VP per season was achieved, totalling 222 hours of VP surveys during the Winter Season 2025/2026.

The timing of watches was tailored to the ecology of the target species present on site, including dawn, day and dusk surveys, to include the full coverage from before sunrise to after sunset. Field information recorded included: dates, VP location, weather, survey start and end time, species observed, time of observation, number of individuals per observation, height of flight (at five bands: 0-25 m, 26-50 m, 51-150 m, 151-200 m, and > 201 m, duration of flight (in seconds),

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TOBIN

reference number to flight line. All flight lines of target species were mapped on field sheets. Behavioural observations were also recorded.

7.2.8 Survey Limitation

Access was granted in all areas of the proposed project site, which were subsequently surveyed by a team of third-party ornithologists under the guidance of Ecology Ireland as well as follow up visits by TOBIN Ecologist to conduct habitat and botanical surveys. However, the following limitations were identified over the survey period:

- The methodology used by the Ecology Ireland survey team for the vantage point surveys in this project is provided in Appendix 7-2. In summary, flight activity was not systematically classified by height band and a proportion of records lacked complete flight height, flight duration and/or mapped flightline data. In addition, some records included mixed flight and non-flight behaviour or were recorded at higher taxonomic groupings, requiring interpretation and standardisation of the dataset prior to collision risk modelling.

To address the potential impacts of these methodological differences, a number of conservative assumptions were applied within the collision risk model. These included treating all flights with incomplete or uncertain height data as occurring at potential collision height; applying standard precautionary avoidance rates in line with NatureScot guidance; applying precautionary flight height distributions where site-specific height band data were incomplete; and applying no reductions to account for potential over-recording or spatial uncertainty.

Each of these assumptions acts to increase predicted collision risk relative to a central or best-estimate scenario. The modelling approach therefore biases the assessment towards over-prediction of mortality rather than under-prediction.

- On that basis, while methodological differences are acknowledged, they have been addressed through the systematic application of conservative assumptions at each stage of the modelling process, each of which operates in the direction of overstating rather than understating collision risk, the assessment conclusions are considered robust and, likely to overestimate rather than underestimate predicted mortality.
- The viewshed analysis was based on shapefiles of vantage point locations and viewshed arcs provided by Ecology Ireland, but the original arcs did not align precisely with the recorded vantage points. To improve spatial accuracy, new arcs were generated using the directional angles of the original arc boundaries, and a 10m buffer was applied to smooth the viewshed edges and maintain coverage (detailed description included in Appendix 7-2). These refinements were technical corrections to ensure spatial consistency between vantage point locations and mapped visibility. The revised viewsheds maintain, and in places marginally extend, the original coverage and do not reduce the surveyed area or bias the assessment towards lower activity estimates. The resulting viewsheds are therefore considered a reasonable and spatially robust representation of visibility from each vantage point.

- Barn Owl is known to occur in the wider surroundings of the proposed project, based on consultation with the DAU, a review of the NBDC and a report by Lusby et al. (2022), however limited evidence of breeding or regular use of the project site was identified during field surveys conducted by Ecology Ireland. This absence of direct observations during the original surveys means that some aspects of the species' use of the site may not be fully captured.
- To address the limited survey records, additional consultation was carried out with BirdWatch Ireland (via Dr John Lusby), who provided information on known barn owl breeding sites in the wider area surrounding the proposed project site. This information, together with a review of available desk-study sources, habitat appraisal of the site and surrounding lands, and published literature on barn owl ecology and sensitivity to disturbance, informed the assessment. While some inherent uncertainty is associated with assessing a predominantly nocturnal species, the combination of consultation, desk study and habitat evaluation provides a sufficient and proportionate basis for the conclusions reached; crucially, the conservative assumptions applied throughout the assessment ensure that this uncertainty has not been resolved in favour of the project.

1. The absence of the independently verifiable methodological information is, in itself, a material deficiency in the EIAR

The survey effort spans two contractors and nine survey seasons. The substantial majority of it, eight of the nine seasons, between April 2020 and September 2024 — was carried out by **Ecology Ireland** across five vantage points (VP1–VP5), with two further points (VPA/VPB) added from November 2022. A single ninth season, Winter 2025/2026, was carried out by **TOBIN**. The Ecology Ireland dataset is therefore the principal source of the flight-activity data that drives the CRM.

The EIAR discloses only the *outputs* and *summary characterisations* of that survey effort. It states that VP surveys were undertaken, identifies the seasons covered, and describes in general terms the field information that "was recorded". The EIAR asserts that this information was recorded. **It does not, however, contain it.** No VP survey log is reproduced for either contractor. No individual watch is recorded with its date, start and end time, observer, and prevailing environmental conditions. No raw flight-line dataset is provided.

This is a material deficiency. A bare assertion that adequate survey effort was undertaken is not the same as evidence that it was. Without the primary survey log, neither the public, An Comisiun Pleanála nor an independent ecologist can verify:

- that the stated survey hours were actually achieved, and distributed appropriately across seasons, times of day, and weather conditions;
- that coverage included the dawn and dusk periods critical to crepuscular and nocturnal species such as Barn Owl;
- that the VP locations afforded the viewsheds claimed;
- that the flight-line records underpinning the CRM are complete and accurately transcribed; or
- that survey conditions were such that target species would have been detectable when present.

This deficiency is compounded because the EIAR itself concedes that the principal dataset is incomplete. At Section 7.2.8 (Survey Limitations), the EIAR acknowledges that the Ecology Ireland surveys did not systematically classify flight activity by height band, and that "a proportion of records lacked complete flight height, flight duration and/or mapped flightline data," with some records containing mixed flight and non-flight behaviour or recorded at higher taxonomic groupings, "requiring interpretation and standardisation of the dataset prior to collision risk modelling." The CRM report likewise records that the survey methodology "deviated in a number of respects from the recommended methodology." These are the Applicant's own admissions that the primary dataset is incomplete and required substantial interpretation before it could be used. That admission makes the disclosure of the primary records more important, not less, for only against the primary data can the adequacy of that interpretation be tested.

Under the EIA Directive, an EIAR must present its analysis in a form that allows the competent authority and the public to scrutinise and test it. Survey conclusions that cannot be checked against the primary data are not robust; the reviewability of the assessment is compromised at its foundation.

This deficiency has been confirmed on independent peer review. Dr Patrick Moran (Appendix 4-6) records that there is a complete absence, both within the Ornithology Chapter and Appendix 7-1, of the summary table required by Annex 3 of the NatureScot guidelines, and that there are no details presented with regard to each Vantage Point survey as to the observer, the start time, the finish time or the prevailing weather conditions. He confirms that this information was requested from An Coimisiún Pleanála, and subsequently directly from Tobin, precisely in order to permit an independent assessment of the viewshed analysis, and that it was not provided. The deficiency is therefore not a matter of interpretation: the primary record required by the developer's own stated standard is absent, and its absence has been independently verified.

2. The Group's efforts to obtain the primary data

The Greater Birr Wind Action Group (GBWAG) did not treat this gap as a matter for inference in the first instance. We sought the source data directly.

The missing information was identified on 19th May, less than a week after the files became publicly available, and a series of phone calls and emails to ACP followed. A written request was sent to ACP Case Officer who pursued it on our behalf. No data arrived. A second request, under the instruction of the ACP Case Officer, was sent via email on June 8th directly to the Tobin Consultants. See below.

FW: Ref Ballincor Wind Farm application: PAX92.324279 - Data request



I am writing on instruction from ACP (see below) in search of critical data associated with the Bird Surveys completed by both Ecology Ireland and Tobin for RWE in their Ballincor Wind Farm Application PAX92.324279. Chapter 7 EIAR makes the following reference.

7.2.2.1.2.1 TOBIN Vantage Point Surveys
Vantage Point Surveys were carried out by TOBIN during the Winter Season 2025/2026, between October to February, at five vantage point locations (VPLs) to further strengthen the data for the Collision Risk Model. The VP methodology followed guidelines issued by the BIAH (2017). The minimum requirement of 30 hours per VP per season was achieved, totalling 222 hours of VP surveys during the Winter Season 2025/2026.
The timing of weather was taken into the ecology of the target species present on site, including dawn, day and dusk surveys, to include the full coverage from before sunrise to after sunset. Field information recorded included: dates, VP locations, weather, survey start and end times, species observed, time of observation, number of individuals per observation, height of flight (at least 10m, 20m, 30-50m, 50-100m, 100-200m, and 200m or above if observed).

7.2.2.1.2.2

TOBIN

reference number to flight line. All flight lines of target species were mapped on field sheets.
Behavioural observations were also recorded.

We are requesting all of the data referenced above in a digital format; VP locations, survey dates, start and end times, weather and details of the individuals attached. These are required to complete an independent review of the Surveys. You can send them directly to me. We would need them as soon as possible. Many thanks in advance.

From: SIDS <sids@pleanala.ie>
Sent: 08 June 2026 14:43

The request for all of the primary survey material expressly referenced in Chapter 7 was lodged; VP locations, survey dates, start and end times, weather conditions, and the details of the individual surveyors, for the legitimate purpose of completing an independent review of the surveys.

The information sought is neither onerous nor unusual. It is the ordinary record of survey effort that any competent ecological contractor generates and retains as a matter of course, and which is, by the EIAR's own account, already in the Applicant's possession. A request of this kind is straightforward to satisfy.

Despite this, and despite the passage of more than four weeks, the primary survey data had not been provided. Given a 7 week window of observation timeliness was critical. At the time of writing that information has still not been produced.

The Group draws the Inspector's attention to this both as a fact bearing on the weight to be afforded the Applicant's unverified survey conclusions, and as a reinforcement of the deficiency identified at Section 1: the data is not merely undisclosed in the EIAR, it has not been made available for independent review even when expressly requested through two separate channels.

3. The Group's response: the basis and purpose of the derived Appendices

In the absence of the primary data, GBWAG has not abandoned the question. We have instead reconstructed, so far as the available material permits, the survey methodology and coverage from the records that *are* contained in the document set — principally the bird observation records in Appendix 7-1 and the CRM outputs in Appendix 7-2.

Appendices 4-1 to 4-5 attached to this chapter are the product of that exercise. They are not presented as the Applicant's data. They are a good-faith, transparent reconstruction, a working-backwards from the disclosed outputs to recover the survey

effort, coverage and assumptions that must have underlain them. Where a value, date or parameter has been inferred rather than stated, it is identified as such, and the basis of the inference is given. The full set of Appendices are listed below and explained later in this chapter.

Appendix 4-1 — Dawn and Dusk Survey Coverage: Analysis and Assessment

Appendix 4-2 — CRM Self-Identified Limitations: Full Catalogue

Appendix 4-3 — Protected Species: Full Status Schedule and Conservation Context

Appendix 4-4 — Vantage Point Survey Effort by Season

Appendix 4-5 — Cumulative Developments: Register and Shared Population Analysis

Appendix 4-6 — Dr Patrick Moran – Expert Ecologist

This approach is both legitimate and necessary:

- It is **necessary** because the Applicant has not supplied the primary material, and the assessment cannot be tested in any other way.
- It is **legitimate** because it draws only on information the Applicant itself has placed on the file, and reasons from it conservatively and explicitly.
- It is **consistent with the Applicant's own methodology**, which — as Section 7.2.8 records, itself required the interpretation, standardisation and reconstruction of an incomplete dataset.
- It is **fair** because, had the primary data been provided, any error in our reconstruction could have been corrected against it. The Applicant retains the data that would resolve any dispute about our derived figures; its choice not to produce that data cannot now be relied upon to dismiss a reconstruction made necessary by that very non-disclosure.

4. Independent Ecological Peer Review

Alongside the Group's own reconstruction set out above and given the technical complexity of the avifaunal assessment, made all the harder to test by the absence of the primary survey data described above, GBWAG engaged an independent

professional ecologist, Dr Patrick Moran, to undertake a peer review of the ecological aspects of the application. Dr Moran's completed report is included at Appendix 4-6 and we strongly urge the Inspector to read his report in advance of this chapter.

Dr Moran holds a first-class honours degree in Environmental Biology (UCD), a Ph.D. in Ecology (UCD), a Diploma in EIA and SEA Management (UCD), an M.Sc. in Geographical Information Systems (Ulster University, Coleraine), a Higher Diploma in Environmental and Planning Law (King's Inns), and an M.Sc. in Environmental and Climate Change Law (UCD). He has over 25 years' experience conducting ecological surveys on both an academic and a professional basis, and has peer-reviewed Environmental Impact Assessment Reports and Natura Impact Statements for a range of public bodies — including An Bord Pleanála, the Office of Public Works and local authorities — as well as private clients, across a wide variety of planning proposals.

Dr Moran's brief was to provide an independent peer review of the ecological aspects of the proposed development, focusing on its potential impact on avifauna and in particular on the potential for likely significant effects on the conservation objectives of the Special Protection Areas in proximity to the site. His terms of reference were directed to the adequacy of the survey methodology and data presented in the Ornithology Chapter of the EIAR and associated documents; the sufficiency of that material to support the conclusions of the Collision Risk Model and the Natura Impact Statement; and the identification of any gaps or deficiencies bearing on the assessment of impacts on protected bird species and designated sites.

His conclusion is unequivocal. Dr Moran finds that the conclusions of both the EIAR and the NIS are “fundamentally and critically flawed owing to the wholly inadequate methodologies utilised to undertake the surveys of the avifaunal resource occurring,” and that the documents as provided cannot sufficiently inform either an Environmental Impact Assessment or an Appropriate Assessment of the proposed development by the competent authority. He identifies, among other matters, the absence of the methodological information required by the NatureScot guidance; the conduct of

vantage point surveys concurrently with other fieldwork; the concentration of the dominant survey effort in the middle of the day; the absence of any disclosed vantage point coordinates and the consequent inability to test the viewshed analysis on which the Collision Risk Model depends; the failure to assess post-sunset use of the site by qualifying interest species; and the failure to assess in-combination effects. His findings are set out in full in Appendix 4-6 and are relied upon by the Group in support of the grounds that follow.

4.1 Introduction

This chapter is submitted pursuant to Article 6(3) of the Habitats Directive (92/43/EEC) and the European Communities (Birds and Natural Habitats) Regulations 2011. It addresses the ornithological component of the Environmental Impact Assessment Report, the Natura Impact Statement, and the Collision Risk Model (Appendix 7-2 to the EIAR) submitted with the application.

It is structured so that An Coimisiún Pleanála, as the competent authority conducting the Appropriate Assessment under Article 6(3), can identify with precision that adverse effects on European site integrity cannot be excluded on the evidence presented and the reason why, given the derogation waivers entered by the developer, refusal is the only lawful outcome available to An Coimisiún Pleanála if that conclusion stands.

4.1.1 Five Principal Failures

This objection is long because the failures it identifies are numerous, each requiring specific evidence from specific documents. There are five principal failures which underpin this chapter.

1. Survey methodology. Eight of the nine survey seasons were conducted by Ecology Ireland with surveys concentrated in the middle of the day. The developer's own Collision Risk Model author acknowledges this directly — zero dawn coverage in summer, 16 total minutes at sunset across all vantage points and all four Ecology Ireland winter seasons combined. Turbine T5 lies outside every viewshed at every height in every season. Summer 2022 is absent without explanation. No nocturnal surveys, no acoustic monitoring, no radar were deployed across any of the nine seasons. The Brosna North Corridor — the zone of highest bird activity for four SPA qualifying interest species, with densities 4.7 to 8.0 times higher than the modelled zone — was excluded from the CRM without any commuting flight analysis. 4 seasons ran 5 Vantage Points, 4 seasons added two more – raising legitimate concerns about the preceding data. Finally one additional season was surveyed by TOBIN and delivered what the CRM author acknowledges is improved data. 1 strong season cannot correct eight deficient ones. Section 2 and Appendices 4-1, 4-2, and 4-4 document this in full.

2. Baseline completeness. Several SPA qualifying interest species — including pintail, curlew, teal, shoveler, kingfisher and Greenland white-fronted goose — received CRM modelling but were then excluded from individual population-level significance assessment. The exclusion rests on a 'fewer-than-ten-records' threshold that is itself a direct consequence of the survey methodology failures above, and which is not applied consistently. Black-tailed godwit, with 'fewer than ten records', was retained because its single large-flock observation produced high estimates; Pintail, with two nationally important counts at the same location in the same month of different years, was dismissed without individual assessment. BirdWatch Ireland confirmed breeding merlin and curlew presence on the adjacent Ballyduff/Clonfinnane SAC in May and June 2025 — evidence that was available before this application was completed and which directly contradicts the developer's assessment of these species as 'rarely recorded'. Sections 2.4 and 3.1 address this.

3. Analytical credibility. The avoidance rate applied for golden plover (99.6%) has been explicitly challenged by the NPWS/DAU across different wind farm submissions as inapplicable to turbines of this scale in this type of landscape. The 1% annual mortality threshold is repeatedly invoked to dismiss near-threshold findings for a species already in unfavourable conservation condition at the SPA without addressing whether the development undermines the population's *recovery potential*, which is the question the precautionary principle requires. A nationally important Pintail flock is dismissed as a one-off event using reasoning inconsistent with how the same type of evidence is treated for black-tailed godwit in the same CRM (where a single large-flock record is retained as reflecting real recurring site use that surveys missed). Section 3 works through these in detail.

4. Species assessment. The collision risk methodology used in this application relies on a threshold requiring predicted collisions to exceed 1% of a species' annual background mortality before the impact is considered significant. The Collision Risk Model's own author acknowledges in Appendix 7-2 that this threshold is "biologically implausible" for small populations with low mortality rates. Despite this explicit caveat,

the assessment excluded five species, the White-tailed Eagle, Hen Harrier, Merlin, Peregrine and Curlew, from any population-level significance calculation. No population data was assembled for Hen Harrier, Merlin, Peregrine or Curlew in the CRM's own population table (Table 2.7). The threshold was not applied to them, they were removed from consideration before reaching it. This matters because each of these species has a national population so small that the loss of even a single individual over the wind farm's operational lifetime is ecologically significant:

- Hen Harrier is an Annex I species with a severely contracted Irish breeding range and in continuing decline; the developer assembled no population data for it in Appendix 7-2 Table 2.7, making it impossible to have applied the 1% threshold even had the developer tried.
- Merlin is an Annex I species confirmed breeding on the immediately adjacent Ballyduff/Clonfinnane Bog SAC in May and June 2025 by BirdWatch Ireland, with the nest subsequently located.
- Curlew has approximately 105 breeding pairs nationally; the loss of one breeding pair equates to roughly 1% of the national population.
- The White-tailed Eagle, a regular visitor to the Ballincor site, has a total population of 150 across the country.

The appropriate question for all five species is not whether the annual collision rate clears a threshold calibrated for abundant stable populations, it is what the predicted lifetime toll means for a population where every breeding adult lost reduces the probability of recovery. That question was never asked. Section 4 and Appendix 4-3 address each species in turn.

5. Cumulative impact. The in-combination assessment in the NIS is, in substance, absent. No developer in the Zone of Influence has calculated combined collision mortality from the four primary developments on the shared SPA populations. Each developer assessed only their own project in isolation, concluded it caused no significant effect, and then — without ever calculating the combined total — treated the sum of those individual "no significant effect" conclusions as itself proof that there was no significant cumulative effect, which is the logical equivalent of arguing that because no single raindrop is responsible for a flood, there can be no flood. Based on the Developers own data (which we do not accept) the combined additive collision

mortality from three developments — Derrinlough, Ballincor and Cush — amounts to 46.8–118.3 golden plover collisions per year on a population already 50% below its SPA baseline. This figure has never been presented in a single document to any competent authority. The NPWS/DAU stated in March 2024 that in-combination effects across this area have not been assessed. Section 5 and Appendix 4-5 document the structural gap.

These five failures are not independent. They compound one another. Surveys that are haphazard, that evolve in a reactive manner over time, that miss dawn and dusk, exclude the highest-density activity zone, and deploy no nocturnal tools produce a dataset that cannot reliably characterise the species most at risk. A dataset that cannot characterise those species produces a CRM that cannot reliably exclude adverse effects. A CRM that cannot exclude adverse effects from one development, applied without correction across four developments in the same Zone of Influence with no independent cumulative assessment, cannot discharge the burden of proof that Article 6(3) places on the applicant.

4.1.2 Principal Grounds of Objection

- Ground 1 — Survey Methodology.** The dominant eight-season Ecology Ireland dataset cannot support a complete and definitive Appropriate Assessment. Surveys were concentrated in the middle of the day, with zero dawn and dusk coverage in summer, near-zero dusk coverage in winter, absent height band classification, non-compliant watch durations, and concurrent watches violating the statistical independence assumptions of the NatureScot model. No nocturnal surveys, acoustic monitoring or radar were conducted in any season. The CRM author acknowledges methodology deviation in Section 1.5 and the inability to calculate recording rates for dawn and dusk periods in Section 3.4.3. Tobin Dataset represents 1 season. The addition of one high-quality season does not retrospectively validate eight deficient seasons. Dr Pat Moran has also identified a separate breach of the NatureScot requirement that “VP survey must not take place simultaneously with any other fieldwork on the site, as it may cause disturbance and invalidate the VP survey results.” Dr Moran (Appendix 4-6) establishes that, on 27 June 2023, a minimum of three vantage point surveys were undertaken at the same time as aquatic surveys were being conducted on the site. The

absence of a survey schedule for either programme prevents the Group from establishing how systematically this occurred; but the developer's own records confirm it occurred at least once, on a date when three of the vantage points were affected. On the NatureScot standard, the affected watches — and any Collision Risk Modelling derived from them — are liable to be invalidated.

- **Ground 2 — The Highest-Density Activity Zone & Spatial Coverage.** The Brosna North Corridor, where bird densities for four SPA qualifying interest species are 4.7 to 8.0 times higher than the modelled zone, was excluded from the Collision Risk Model with no commuting flight analysis to replace it. Turbine T5 falls outside every viewshed at every height in every season. There is no empirical flight activity data at collision height for this turbine location anywhere in the survey programme. The two places in this landscape where collision risk is most concentrated are the two places the assessment does not reach.
- **Ground 3 — Nocturnal, Acoustic and Radar Surveys: Total absence.** No nocturnal surveys. No acoustic monitoring. No radar. Not in any season, for any species, at any point in a nine-season programme. The regulatory authority has stated explicitly that the full impact of a development of this kind cannot be assessed without this information. The only methodology that would have detected confirmed Annex I breeding within the foraging range of the development was never deployed. Seven species in the CRM have their nocturnal activity estimated from literature values because no site data exists. This is not a gap — it is a void.
- **Ground 4 — Curlew and Merlin: Collective Assessment of Nationally Critical Species Alongside Common Species is Not Lawful.** BirdWatch Ireland 2025 confirmed breeding merlin — an Annex I species — on the SAC 2.8km from the proposed turbines in May and June 2025. The nest was located. The confirmed breeding pair forages across a range that overlaps the turbine zone directly. Curlew, a Red-listed species with approximately 105 breeding pairs nationally, was confirmed present on the same SAC during the breeding season. The loss of one pair is almost 1% of the national population, the regulatory authority has said so explicitly, for this location. Merlin is an Annex I species confirmed breeding within the foraging range of the development. Both are assessed collectively alongside coot, common gull and herring gull. No individual collision risk assessment. No targeted breeding survey. No breeding disturbance

analysis. No population-level significance assessment. The inference of limited site use from low record counts is directly contradicted by the survey methodology failures and by the 2025 breeding confirmation. This collective treatment has no legal or ecological justification.

- **Ground 5 — Small-Population Species: The 1% Annual Mortality Threshold Cannot Lawfully be Applied to a National Wild Population of 150 Individuals.** The entire wild Irish white-tailed eagle population is approximately 150 individuals. The CRM's own author acknowledges the 1% threshold may be biologically implausible for small populations with low mortality rates. White-tailed eagle was excluded from any population-level significance assessment before the threshold was even reached. One dead eagle over the operational lifetime of this wind farm represents a meaningful fraction of the entire national population of a species recovering from functional extinction. A threshold designed for abundant, stable populations is not a complete or definitive assessment tool for a species in this position. The same structural failure applies to hen harrier, for which no population data was assembled in the CRM at all.
- **Ground 6 — Golden Plover: Inapplicable Avoidance Rate; Unfavourable Conservation Condition; Recovery Trajectory Not Assessed.** The 99.6% avoidance rate applied for golden plover has been explicitly challenged by the regulatory authority as derived from turbines half the size of those proposed, in landscapes entirely unlike this one. The SPA population is already in unfavourable conservation condition — 50% below its baseline reference values. The upper uncertainty range of the developer's own collision estimate already exceeds the 1% local SPA population mortality threshold. The assessment addresses only whether the central estimate at the preferred rate clears a threshold the CRM itself describes as precautionary. It never asks whether the development undermines the population's potential for recovery to favourable conservation status. That is the question the conservation objectives require to be answered. It was not asked.
- **Ground 7 — Whooper Swan: CRM Admits Potential Under-Estimation; Established Flightline Through the Development Zone Unassessed.** The CRM's own author acknowledges that uneven diel coverage may have caused under-estimation of whooper swan collision risk. An established communal roost connected to the SPA by a documented flightline through the development Zone of Influence generates pre-

dawn commuting traffic that is entirely unrecorded across all nine seasons. Physical evidence of repeated collision on this flightline exists — bird strike deflectors were installed by ESB Networks on powerlines in the area. Having acknowledged potential under-estimation and confirmed an unassessed roost flightline, the EIAR concludes negligible impact. That step from acknowledged under-estimation to negligible conclusion is asserted, not demonstrated. Adverse effects on an Annex I SPA qualifying interest cannot be excluded on this basis.

- **Ground 8 — Pintail and Analytical Inconsistency: Nationally Important Counts Dismissed Using Reasoning the Same CRM Refused to Apply to Black-tailed Godwit.** Two nationally important pintail counts — at the same location, in the same month, in different years — were dismissed as a one-off event with no individual CRM modelling. Pintail is a SPA qualifying interest. The CRM's own logic, applied elsewhere to black-tailed godwit, holds that a large-flock record observed during surveys covering 1.5–2% of daylight hours may reflect regular use systematically missed. That logic was used to retain black-tailed godwit in the model. It was not applied to pintail. The asymmetry is unexplained. No lawful exclusion of adverse effects on a SPA qualifying interest species can rest on a dismissal that contradicts the developer's own internal reasoning.
- **Ground 9 — No Operational Bird Mitigation and No Lawful Pathway to Adaptive Management.** No dedicated mitigation measures exist for the operational phase. None. The entire no-adverse-effects conclusion rests on the adequacy of the pre-consent assessment — which this submission demonstrates is structurally inadequate. For species where post-construction mortality is irreversible, post-consent discovery through monitoring is not a recoverable position. The bird monitoring programme contains an adaptive management trigger, but the regulatory authority has stated directly that it cannot approve changes or conditions after consent is granted. The trigger has nowhere to go. The mechanism to act on monitoring findings does not exist. There is no backstop.
- **Ground 10 — Cumulative Impact: The In-Combination Assessment is Absent, Not Merely Inadequate.** Each developer accepted the previous developer's nil-effects conclusion as a settled baseline and concluded that nil plus nil equals nil. European Commission guidance explicitly states this is insufficient. The combined golden plover

collision mortality from three developments in this Zone of Influence is 46.8 to 118.3 birds per year on a population already 50% below its SPA baseline — between nine and thirty-nine times the threshold each developer individually dismissed as precautionary. This figure has never been presented to any competent authority in a single document. The regulatory authority stated in March 2024 that in-combination effects across this area have not been assessed. That statement remains true of this application.

- **Ground 11 — IROPI Waiver.** Both derogation pathways under Article 6(4) of the Habitats Directive have been expressly waived by the developer. If adverse effects on site integrity cannot be excluded following a complete and legally compliant assessment, refusal is the only lawful outcome available to An Coimisiún Pleanála.

4.1.3 The document is structured sequentially.

The chapter is organised in six sections, each building on the last and each serving a distinct function in building the overall position.

Section 1: 4.2 Context - establishes the regulatory benchmark against which the entire application is tested. It sets out the NPWS scoping requirements, NatureScot 2024 survey standards, the qualifying interests of all European sites within the Zone of Influence, and the precedent established by the DAU in its Carrig and Cush submissions. It addresses the shared ecological landscape and the legal consequence of the derogation waiver. Every subsequent section measures the developer's assessment against this benchmark.

Section 2: 4.3 Survey Methodology - is the forensic core of the chapter. It works through the survey programme systematically — vantage point spatial coverage, the Brosna Corridor density exclusion and commuting flight gap, dawn and dusk coverage gaps quantified from the developer's own CRM Tables 3.8 and 3.9, the absence of summer 2022, the environmental condition data required by the NPWS scoping response but not submitted, the complete absence of nocturnal, acoustic and radar surveys, and the 2025 BirdWatch Ireland breeding merlin evidence. It closes with a 22-row summary table and a conclusion on the cumulative and directional effect of the methodology failures. It cross-references Appendices 4-1, 4-2, 4-3, 4-4 throughout.

Section 3: 4.4 Analysis of Data - accepts the surveys as delivered and asks whether the analysis constructed from them holds up. It examines baseline completeness, the dominant dataset problem, population denominators, avoidance rate selection, displacement distances and ex-situ SPA connectivity. Section 3.6 addresses five specific logical steps in the developer's reasoning that the objection challenges — the pintail dismissal, the repeated use of the 1% threshold mechanism, the black-tailed godwit selective application of large-flock caution, the whooper swan diel gap acknowledgement without consequence, and the height overestimation argument. Section 3.7 addresses the mitigation framework — or more precisely, its complete absence from the operational phase. It cross-references Appendix 4-2 throughout.

Section 4: 4.5 Species analysis - provides a species-by-species assessment. Priority 1 species — whooper swan, curlew, merlin and white-tailed eagle — receive full sub-sections. Priority 2 species — golden plover, Greenland white-fronted goose, hen harrier and pintail — receive focused treatment. Priority 3 covers SPA waterbirds and other species of concern. Section 4.11 addresses habitat connectivity and the SAC corridor. It cross-references Appendix 4-3 throughout.

Section 5: 4.6 Cumulative effect - makes the structural gap argument on cumulative impact. It sets out the Article 6(3) legal framework, identifies one shared ecosystem being addressed by four separate applications each arguing only their own case, presents the combined collision mortality figure that no developer has ever calculated, and addresses additive displacement and corridor fragmentation. It exposes the circular nil-effects methodology that results when each application treats the others as pre-existing background. It cross-references Appendix 4-5 throughout.

Section 6: 4.7 Summary - summarises the five principal failures and sets out the grounds for refusal. It addresses the IROPI waiver and closes with the precautionary principle statement.

4.1.4 Appendices

All data submitted by the developer was interrogated. Data from the Applicant's Appendix 7-1, 7-2 and 7-3 and the AA NIS was used to verify and corroborate every position taken in this submission. That audit exercise is presented across the five appendices. Each addresses a specific aspect of the evidential record that is too detailed for the main chapter sections but too important to omit. Every finding in the main chapter that depends on primary data is cross-referenced to the relevant appendix. The appendices are the foundation on which this chapter was drawn. Any contested factual claim is addressed with the underlying data, verbatim CRM extracts, and species-by-species analysis in the appendices.

Appendix 4-1 — Dawn and Dusk Survey Coverage: Analysis and Assessment.

Reproduces and annotates the developer's own diel effort tables in full, quantifying the structural absence of dawn and dusk coverage across all eight Ecology Ireland seasons and setting out the species-specific consequences for whooper swan, curlew, golden plover, Greenland white-fronted goose, hen harrier and merlin.

Appendix 4-2 — CRM Self-Identified Limitations: Full Catalogue. A catalogue of 25 limitations, caveats and species exclusions drawn entirely from the developer's own Collision Risk Model, each with its CRM page reference and a cross-reference to the section of this chapter where it is challenged.

Appendix 4-3 — Protected Species: Full Status Schedule and Conservation Context.

Eleven sub-sections, one per species group. Each provides a compact status block covering all protection designations, population estimates, recorded presence in the Zone of Influence, the developer's own assessment summary, and the specific basis on which that assessment is challenged.

Appendix 4-4 — Vantage Point Survey Effort by Season. Four tables examining 1. Survey hours per VP per season against the NatureScot minimum; 2. a side-by-side methodology comparison across eleven criteria for Ecology Ireland and TOBIN; 3. turbine-by-turbine viewshed spatial coverage including VP arc compliance rates; and 4. the Brosna Corridor spatial structure analysis.

Appendix 4-5 — Cumulative Developments: Register and Shared Population

Analysis. Four-part analysis of the absent cumulative assessment. The development register covers the four major projects within the 20km radius. The assessment uses figures from the developers' own documents and delivers combined collision mortality figures not previously calculated — 46.8–118.3 golden plover collisions per year across three developments — alongside verbatim NIS language from each developer with challenge responses, and an exposure of the circular nil-effects methodology that results when each application treats the others as pre-existing background.

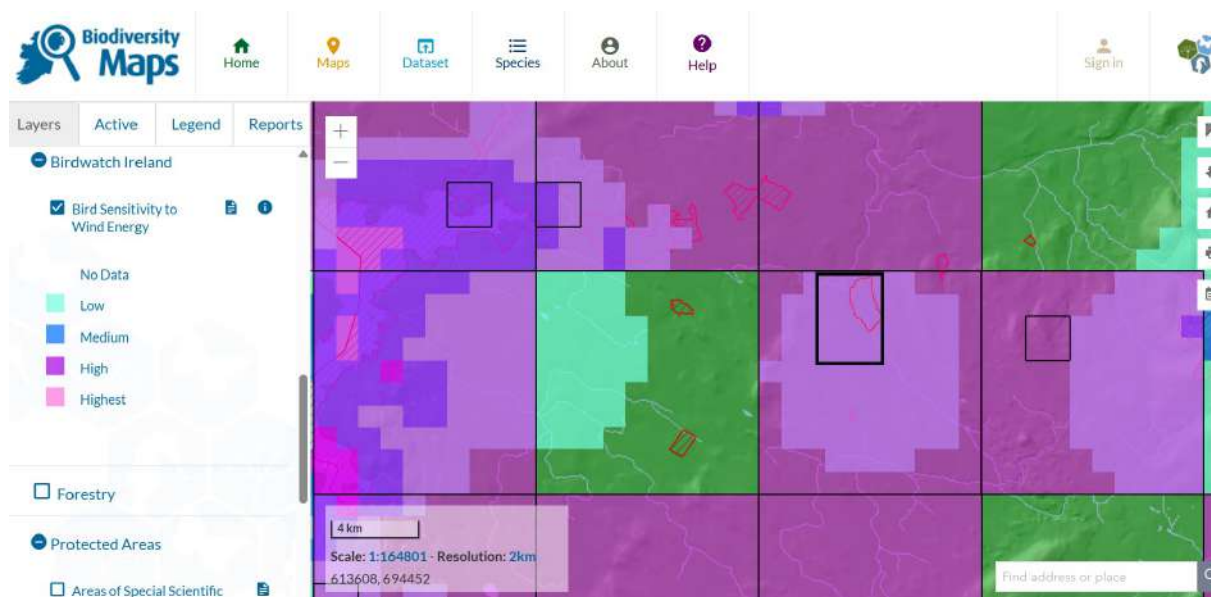
Appendix 4-6 – Dr Pat Moran Expert Ecologist – Ballincor Windfarm Observation

Demonstrating that the burden of proof has not been discharged requires engaging with each layer of the developer's assessment so although this chapter is long the underlying legal proposition is simple.

Under Article 6(3) of the Habitats Directive, An Coimisiún Pleanála can grant consent only after having ascertained, not merely suspected, but ascertained, that the proposed development will not adversely affect the integrity of any European site. Where the AA cannot exclude adverse effects on SPA qualifying interest species, consent cannot lawfully be granted.

4.2 Context

The map below is taken from the National Biodiversity Data Centre's (NBDC) online mapping portal. The specific layer displayed is BirdWatch Ireland's "Bird Sensitivity to Wind Energy" dataset (shown active in the left-hand Layers panel), with the five-class sensitivity scale: No Data / Low / Medium / High / Highest. The area highlighted shows the Sog and the black rectangle broadly captures the Windfarm development area and is identified in the legend as an area with the 'HIGHEST' Bird sensitivity to Wind Energy.



The map below assesses bird sensitivity to Wind Energy across Ireland and notice the vast tracks of land with No, Low or Medium impact. This triggers the Coolglass Supreme Court judgement discussed in the previous chapters.



4.2.1 The Shared Ecological Landscape — Zone of Influence

The developer's NIS defines the Zone of Influence (Zoi) for bird species with reference to a 5km core range. This is the central spatial assumption of the assessment. It determines which species are treated as connected to the adjacent SPAs, how displacement is assessed, and which cumulative developments are considered materially relevant. The assumption cannot stand.

The NPWS Development Applications Unit, in its formal submission on the previous Carrig Wind Farm application — at 3.9 km from Ballincor, in the same shared ecosystem — stated explicitly: 'The Department does not accept the findings of the EIAR/NIS in relation to a 5km core range for bird species.' The DAU continued: 'The Department considers it entirely possible that there may be movement between the sites, constituting ex-situ usage of the development zone of influence by qualifying interest species from the SPA.' The NPWS scoping response for Ballincor itself confirmed that 'where bird flight paths or ex-situ habitats are involved the impact may be on a Special Protection Area (SPA) more than 15 km away.'

For mobile species — migratory waterbirds, large waders, wildfowl — the ecologically relevant Zone of Influence is defined not by a fixed radius but by the movement

ecology of the species. Whooper swans commuting between the Sharragh NPWS roost and the River Little Brosna Callows SPA pass through the development zone regardless of what administrative radius a developer draws around it. Golden plover flocks of 3,500 birds recorded within 500m of the site boundary are SPA qualifying interest birds by precautionary default — the DAU Cush letter (March 2024) makes this explicit. A tagged Greenland white-fronted goose was recorded within 6km of the Cush site during migration from the Wexford Slobbs.

On any ecologically credible definition of the Zone of Influence, Carrig Wind Farm (3.9km) falls within it. On the developer's own figures, Cush (10km) and Derrinlough (13km) are acknowledged as relevant cumulative developments. The River Little Brosna Callows SPA — with eleven qualifying interest species including three of international importance — lies 7km from the site boundary, connected by the River Brosna corridor that runs through the development zone. The operative Zone of Influence for this assessment is the shared SPA/SAC catchment and the movement ecology of the species that use it. This document treats it as such throughout.

4.2.2 The Derogation Waiver — Its Legal Consequence Is Determinative

The NIS (p.4) states: *'the project proponent places no reliance upon' Article 6(4) imperative reasons of overriding public interest.*" The WFD Assessment (Appendix 9-1 to the application, p.28) states the project does not require assessment under Article 4.7 of the Water Framework Directive. Both derogation pathways that would otherwise allow a project to proceed notwithstanding adverse effects on European site integrity have been expressly and voluntarily waived by the developer.

The legal consequence of both waivers is absolute and requires no interpretation. Under Article 6(3) of the Habitats Directive as interpreted by the CJEU in Waddenzee (C-127/02) and Sweetman (C-258/11), an Appropriate Assessment must be complete, precise and definitive. The competent authority 'can agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site.' If it

cannot ascertain this — if reasonable scientific doubt remains after a complete assessment — it cannot grant consent.

4.2.3 Regulatory Standards and Qualifying Interests – The benchmark

This section sets out the regulatory and scientific standards that applied to the Ballincor Wind Farm application at the time of survey design and submission. It identifies the specific requirements placed on the applicant by the NPWS scoping process, the qualifying interests of the European sites within the Zone of Influence, the survey standards established by NatureScot (2024), and the regulatory precedent set by the DAU in its submissions on the comparable Cush and Carrig applications. It closes with a conservation status summary establishing the ecological stakes before any assessment of survey adequacy or impact magnitude begins. This section establishes the benchmark against which the survey effort and analysis are tested in every subsequent section of this objection.

4.2.4 NPWS Scoping Response — Requirements Placed on the Applicant

The National Parks and Wildlife Service (NPWS) Development Applications Unit issued a scoping response to RWE in respect of the proposed Ballincor Wind Farm. That response set out the specific ecological survey and assessment requirements the Department expected the applicant to address. The following requirements are relevant to ornithology and are extracted from the scoping response document.

4.2.4.1 Bird surveys — minimum standard

The NPWS scoping response states explicitly: 'Two full years of Bird Surveys is considered to be the minimum required. However, data must be sufficient to support conclusions and this may require substantially more survey work over longer periods of time.'

The scoping response further requires that bird survey results 'need to be referenced back to the overall local, regional, national and European populations and their dynamics as, in some cases even a small risk to a population of a species could be considered significant.'

This last requirement is of particular importance. It establishes that the NPWS expected population-level assessment, not merely a site-level count, for every species at risk. For a species such as curlew with approximately 105 breeding pairs nationally, or white-tailed eagle with approximately 150 individuals nationally, the NPWS requirement that even a small population-level risk be treated as significant sets a standard that individual-level mortality cannot be dismissed.

4.2.4.2 Survey methodology and data presentation

The scoping response requires that 'the full survey methodology as well as raw data, including dates and times are detailed.' It specifies that records must be supported by 'basic environmental data such as hourly estimates of visibility, glare arcs, cloud cover and precipitation during Vantage Point (VP) and Walkover Survey periods.'

These requirements establish that the NPWS expected surveys to be documented to a standard that allows independent verification of survey conditions. The identification of reduced-visibility watches in the CRM (11% of Ecology Ireland watches; 7% of TOBIN watches) is an acknowledgement that not all surveys met this standard.

4.2.4.3 Barn owl — specific requirement

The scoping response identifies the site as being in an area of high sensitivity for barn owls, citing BirdWatch Ireland's Bird Sensitivity to Wind Energy mapping tool, and states: 'Detailed and specific surveys on barn owls should be completed and mitigation included if impacts are identified.' An NPWS officer confirmed a breeding nest site approximately 75 metres from the wind farm site boundary in July 2023.

4.2.4.4 European sites, ex-situ habitats and bird flight paths

The scoping response notes that the study area for ecological assessment must include all European sites and designated areas potentially connected with the proposed development, and specifies that 'where bird flight paths or ex-situ habitats are involved the impact may be on a Special Protection Area (SPA) more than 15 km away.' This establishes that the NPWS did not accept a restrictive Zone of Influence for mobile species from the outset.

4.2.4.5 Lighting

The scoping response requires that 'consideration should be given to increased levels of artificial lighting required and the potential impact on all wildlife, particularly nocturnal animals, during construction and operation.' The NPWS/DAU Carrig submission notes the absence of any reference to turbine lighting in the ornithological impact assessment of that application. The same absence applies to Ballincor.

4.2.5 Qualifying Interests — European Sites in the Zone of Influence

The following European sites have been identified in the Ballincor NIS and EIAR as being within the Zone of Influence of the proposed development. For each, the qualifying interests or features and their associated conservation objectives are set out. These are the species and habitats that any complete and definitive Appropriate Assessment must address.

4.2.5.1 River Little Brosna Callows SPA (Site Code 004086)

Located approximately 7–8.5km north of the proposed wind farm site. The SPA follows the River Brosna from its confluence with the River Shannon for approximately 9km. The main habitat is extensive low-lying callow grassland subject to prolonged winter flooding. The SPA is of international importance for three species — golden plover, black-tailed godwit, and Greenland white-fronted goose — and of national importance for a further seven species. The SPA also supports a nationally significant assemblage of over 20,000 wintering waterbirds.

Qualifying Interest / Feature	Code	First Order Conservation Objective
Whooper Swan (Cygnus cygnus)	A038	To maintain the favourable conservation condition
Wigeon (Mareca penelope)	A050/A855	To restore the favourable conservation condition
Teal (Anas crecca)	A052	To maintain the favourable conservation condition
Pintail (Anas acuta)	A054	To maintain the favourable conservation condition
Shoveler (Spatula clypeata)	A056/A857	To maintain the favourable conservation condition
Golden Plover (Pluvialis apricaria)	A140	To maintain the favourable conservation condition
Lapwing (Vanellus vanellus)	A142	To maintain the favourable conservation condition
Black-tailed Godwit (Limosa limosa)	A156	To maintain the favourable conservation condition
Black-headed Gull (Chroicocephalus ridibundus)	A179	To maintain the favourable conservation condition
Greenland White-fronted Goose (Anser albifrons flavirostris)	A395	To restore the favourable conservation condition
Wetland and Waterbirds	A999	To maintain the favourable conservation condition

Three of these qualifying interests — whooper swan, golden plover and Greenland white-fronted goose — are also listed on Annex I of the EU Birds Directive, conferring an additional layer of legal protection. The conservation objective for Greenland white-fronted goose is notably to restore, not merely maintain, favourable condition — indicating that the population is already in an unfavourable state at baseline.

4.2.5.2 Middle Shannon Callows SPA (Site Code 004096)

Located approximately 10–12km downstream of the proposed project site, connected via the Little Brosna tributary and the River Shannon. The site is of international

importance for whooper swan, black-tailed godwit, and the total waterbird assemblage (over 20,000 wintering birds).

Qualifying Interest / Feature	Code	First Order Conservation Objective
Whooper Swan (Cygnus cygnus)	A038	To maintain the favourable conservation condition
Corncrake (Crex crex)	A122	To maintain the favourable conservation condition
Golden Plover (Pluvialis apricaria)	A140	To maintain the favourable conservation condition
Lapwing (Vanellus vanellus)	A142	To restore the favourable conservation condition
Black-tailed Godwit (Limosa limosa)	A156	To restore the favourable conservation condition
Black-headed Gull	A179	To restore the favourable conservation condition
Wigeon (Mareca penelope)	A855	To restore the favourable conservation condition
Wetland and Waterbirds	A999	To maintain the favourable conservation condition

4.2.5.3 Sharavogue Bog SAC (Site Code 000585)

The SAC boundary lies at its nearest point approximately 10 metres from the proposed wind farm site boundary. This proximity is not incidental — the SAC is immediately adjacent to the development and the hydrological, physical, and ecological connectivity between the site and the SAC has been confirmed in the EIAR. The SAC is designated for three Annex I habitats.

Qualifying Interest / Feature	Code	First Order Conservation Objective
Active Raised Bogs [7110*]	Priority	To restore the favourable conservation condition — target: restore active raised bog area to 40.9ha
Degraded Raised Bogs still capable of natural regeneration [7120]	Annex I	Conservation objective linked to and dependent on achievement of 7110 objective

Depressions on peat substrates of the Rhynchosporion [7150]	Annex I	Conservation objective integral to Active Raised Bog — no separate target set

4.2.5.4 Ballyduff/Clonfinnane Bog SAC (Site Code 000641)

Located approximately 2.8km northwest of the proposed wind farm site. Designated for the same raised bog habitat suite as Sharavogue Bog SAC: Active Raised Bogs [7110*], Degraded Raised Bogs [7120], Depressions on peat substrates [7150], and additionally Bog Woodland [91D0*] — another priority habitat. The developer's EIAR concludes no viable pathway exists between the proposed project and this SAC in ornithological terms.

The 2025 BirdWatch Ireland breeding bird survey, conducted on Ballyduff/Clonfinnane SAC in May and June 2025 using six passive acoustic recording units. That survey confirmed the presence of breeding merlin (*Falco columbarius*) on the SAC, with the nest subsequently located. Curlew (*Numenius arquata*) was also confirmed present during the breeding season. Merlin typically forages 2–3km from the nest during the breeding season. At 2.8km from the proposed turbine zone, the Ballyduff/Clonfinnane SAC sits at the inner edge of that foraging range — meaning the confirmed breeding pair may regularly hunt over land within or immediately adjacent to the proposed development site. The EIAR dismissed this pathway.

4.2.5.5 Adjacent and connected sites

Additional European sites within the broader Zone of Influence noted in the EIAR include All Saints Bog SPA (004103) and All Saints Bog and Esker SAC (000566), for which Greenland white-fronted goose is a qualifying interest; Dovegrove Callows SPA, also designated for Greenland white-fronted goose; Redwood Bog SAC (002353); and Arragh More (Derrybreen) Bog SAC (002207), approximately 5.2km west of the site. The midland bog SAC network — including these sites together with Sharavogue and Ballyduff/Clonfinnane — functions as an ecological corridor for breeding raptors and waders moving between raised bog habitats. The cumulative barrier effect of the proposed development on this corridor is addressed in Section 5 and Appendix 4-5.

4.2.6 NatureScot 2024 Survey Standards

NatureScot (formerly Scottish Natural Heritage) publishes the survey guidance that is adopted as best practice in Irish wind energy ornithological assessments, including by the NPWS/DAU. The relevant guidance for this application is NatureScot (2024/2025a): 'Recommended bird survey methods to inform impact assessment of onshore wind farms.' The Ballincor CRM itself is modelled on this guidance, making it **the developer's own stated standard**. The following requirements are directly relevant to this objection.

4.2.6.1 Vantage point survey duration and seasonal coverage

- Minimum coverage: two complete winter seasons and two complete summer seasons of vantage point surveys. This is a minimum, not an optimum. Additional seasons are expected where data from the minimum does not support reliable conclusions.
- Survey watches: continuous three-hour watches with a 30-minute break between watches, in good visibility conditions. Continuous six-hour watches without the required break are non-compliant.
- Temporal coverage within each survey day: surveys should cover the full daylight period from before sunrise to after sunset. For waterfowl species specifically, the guidance requires coverage of the hour before sunrise and the hour after sunset, as these periods are 'potentially important for commuting swans and geese' (NatureScot 2025a, cited in Ballincor CRM Section2.3).
- Height band classification: flight activity must be recorded in five NatureScot-compliant height bands (0–25m, 25–50m, 50–150m, 150–200m, >200m above ground level) to allow accurate assessment of the proportion of flight activity at collision height.

1.4.2 Nocturnal surveys

- NatureScot 2024 requires that the potential for nocturnal flight activity is considered and, where relevant, quantified. For waterfowl — including whooper swan, wigeon, and golden plover — the guidance explicitly requires coverage of the hour before sunrise and after sunset to capture crepuscular commuting movements.
- The NatureScot collision risk model itself acknowledges (via the nocturnal activity ranking system) that curlew, golden plover, lapwing, black-tailed godwit, wigeon, teal, and mallard are all partially active at night.

4.2.6.2 Acoustic monitoring and nocmig

- NatureScot 2024 recommends the use of acoustic monitoring, including passive nocturnal migration (nocmig) recording, to indicate bird usage of the Zone of Influence during hours when vantage point surveys are not conducted. This technology is now widely available and routinely deployed. The 2025 BirdWatch Ireland survey on Ballyduff/Clonfinnane SAC used exactly this methodology — Autonomous Recording Units deployed over five days — and detected breeding merlin that would not have been identified by conventional vantage point surveys.

4.2.7 DAU/ABP Precedent — Requirements from Comparable Applications

The NPWS Development Applications Unit has made detailed submissions on two wind farm applications in the same Zone of Influence that are directly relevant as regulatory precedent. Both applications involved comparable turbine scales, the same SPA qualifying interest species, and the same landscape context. What the DAU required of those applicants represents the regulatory standard that this application must also meet.

4.2.7.1 Carrig Wind Farm (ABP 318689) — NPWS/DAU submission

The DAU submission on the Carrig Wind Farm application (within 5km of Ballincor, in the shared ecosystem) set out the following specific requirements. These are extracted from the DAU submission as documented in the ABP Inspector's Report (ABP-318689-23):

Zone of Influence and SPA connectivity:

"The Department's view is that protected SPA birds may range far more widely and can therefore be affected by windfarms outside the SPA boundaries, particularly on transit to other feeding and/or roosting sites outside the SPA. The Department does not accept the findings of the EIAR/NIS in relation to a 5km core range for bird species. The Department considers it entirely possible that there may be movement between the sites, constituting ex-situ usage of the development zone of influence by qualifying interest species from the SPA."

Significance for this application: The Ballincor NIS applies a 5km core range for bird species. The DAU has explicitly stated it does not accept this approach. The same challenge applies to Ballincor.

The DAU's view — that SPA birds may range far more widely and that ex-situ usage of the ZOI cannot be excluded — sets the standard for connectivity assessment that Ballincor has not met.

Nocturnal surveys and nocmig:

"Bird surveys [were] carried out during daylight hours and some limited nocturnal surveys for limited species. No nocturnal surveys of migration or nocturnal commuting movements of wildfowl over or in the zone of influence of the site. A range of wildfowl known to carry out movements at night, which the daylight surveys would have missed. Acoustic recording of calls from migrating birds over fixed points at night (nocmig) is now widely used and should be used to indicate bird usage in the zone of influence of the proposed development. Also, radar could be used to quantify bird movements above a certain height. The Department's view is that the full impact of the development cannot be assessed without this information."

Significance for this application: No nocturnal surveys, nocmig, or radar were deployed in the Ballincor ornithological programme across any of the nine survey seasons. The DAU's stated position — that the full impact cannot be assessed without nocmig and radar — applies directly and unchanged to this application.

Whooper swan flightlines and collision risk:

"Only bird sightings from daytime vantage point surveys were included, but surveyors did note nighttime movement of whoopers on at least one occasion. No nighttime collision risk analysis carried out despite significant potential for nighttime movements of birds. It is proposed to locate the turbines within a pre-existing regularly used whooper swan flight line. These birds could be displaced or if they maintain current usage be at greater than normal collision risk."

Significance for this application: A confirmed whooper swan roost at NPWS-owned land at Sharragh — between the Carrig and Ballincor development zones — uses a flightline toward the Little Brosna SPA that passes through or adjacent to the Ballincor Zone of Influence. The DAU's concern about locating turbines on a pre-existing whooper swan flightline applies here with equal or greater force.

Curlew — 1% national population significance:

"Collision mortality or displacement could be considerable for species which are already in serious decline, e.g. there are c.105 breeding pairs of curlew left in Ireland, therefore the loss of one pair would equate to almost 1% of the national breeding population."

Significance for this application: This statement — made by the DAU in respect of the Carrig application — establishes the regulatory precedent that curlew cannot be assessed as a low-significance species at this location. With approximately 105 breeding pairs nationally, the DAU holds that individual-level mortality or displacement must be treated as significant. Ballincor assesses

curlew collectively in the 'rarely recorded' group with no individual assessment. This is inconsistent with the regulatory standard set by the DAU for an application in the same shared ecosystem.

In-combination assessment:

"No reference in ornithological impact assessment to the proposed lighting of the turbines or site... The full impact of the development cannot be assessed without [nocmig and radar] information."

Significance for this application: The DAU's finding that Carrig's assessment was incomplete for failure to address nocturnal movements applies to Ballincor. Both omissions — nocmig/radar and turbine lighting — are present in the Ballincor EIAR.

4.2.7.2 Cush Wind Farm (ABP 318816-24) — NPWS/DAU submission, 1 March 2024

The DAU's formal submission on the Cush Wind Farm application — granted in November 2024 — is the most recent and authoritative regulatory statement on ornithological survey and assessment standards for wind farms in this Zone of Influence. Key requirements are extracted below.

Golden plover — SPA connectivity and assessment standard:

"Due to the proximity of the SPAs to the project site and a lack of any scientific evidence to the contrary, and in accordance with the precautionary principle, the Department considers that it must be assumed that these birds are part of the SPA populations and therefore there is ecological connectivity to these sites."

Significance for this application: The Ballincor NIS does not assume SPA connectivity as the default. It requires evidence of connectivity before treating birds on the site as SPA birds. The DAU's position — that the precautionary principle requires the opposite assumption — sets the standard that Ballincor has not applied.

Avoidance rate applicability:

"The Department notes that these rates are based at wind farms with maximum turbine diameters of 92m. The proposed wind farm has a rotor/turbine diameter of 172m. The data used is from six wind farms in the UK, which appear to be in a lowland intensive agricultural setting (tillage). This is very different from the landscape surrounding the currently proposed windfarm which is a mixture of cutaway and cutover bog, conifer plantation and pasture."

Significance for this application: Ballincor applies avoidance rates of 99.6% for golden plover — the same rates challenged by the DAU for Cush. The Ballincor turbines have rotor diameters of 149–163m. The DAU challenge is directly applicable: avoidance rates derived from 92m-diameter turbines in UK

tillage landscapes cannot be assumed to apply to 149–163m machines in midland Irish bog and pasture.

In-combination assessment — explicit statement of failure:

"The Department considers that the risk to birds on migration of being involved in collisions with the proposed wind farm in its operational phase has not been satisfactorily evaluated by the applicant. Additionally, in-combination effects of several wind farms across this area on migrating birds has not been assessed."

Significance for this application: This is the DAU's clearest statement on cumulative assessment failure in this landscape. It was made in March 2024 — after the Ballincor survey programme was already underway and before the Ballincor application was submitted. The in-combination assessment gap identified for Cush is present, unchanged, in the Ballincor NIS (see Section 5 and Appendix 4-5).

4.2.8 Conservation Status

Before any assessment of survey adequacy or impact magnitude, it is necessary to establish the conservation context within which this application falls. Several of the species most at risk from the proposed development are already in unfavourable conservation condition or at critical national population levels. This context is not background information — it is directly relevant to the legal test under Article 6(3), which requires assessment of whether a project would adversely affect the integrity of a European site. For a species already in unfavourable condition, the question is not merely whether the development accelerates decline, but whether it undermines the potential for recovery.

4.2.8.1 Golden plover — unfavourable condition at the SPA

The River Little Brosna Callows SPA conservation objectives document (NPWS, January 2025) confirms that the national population of wintering golden plover in Ireland has declined by 54% from 1994/95 to 2019/20 as monitored via IWeBS. The NPWS/DAU Cush letter (March 2024) states that golden plover is considered to be in unfavourable condition, with mean peak counts between 2016/17 and 2020/21 standing at 50% below the baseline reference values. National declines exceeding 20% have been recorded.

The first order conservation objective for golden plover at the SPA is to maintain the long-term winter population trend as stable or increasing. A development that adds annual collision mortality to a population already 50% below its baseline, in an area where the existing trajectory is one of continuing decline, does not merely add to a population — it undermines the realistic possibility of recovery to favourable conservation status. This framing — whether the project undermines recovery — is the standard the DAU applies and the standard this objection adopts.

4.2.8.2 Curlew — approximately 105 breeding pairs nationally

The Eurasian curlew is one of Ireland's most critically threatened breeding birds. The national breeding population stands at approximately 105 breeding pairs (NPWS data, confirmed in the DAU Carrig submission). The DAU's own statement in that submission makes the mathematics unambiguous: the loss of a single breeding pair equates to approximately 1% of the national breeding population.

The NPWS has designated curlew conservation a national priority. The species is Red-listed in Ireland and on Annex I of the EU Birds Directive. It was confirmed breeding in the region of the Arragh More Bog NHA to the southwest of Sharragh in the 2021 national breeding curlew survey — within the shared Zone of Influence. The 2025 BirdWatch Ireland survey on Ballyduff/Clonfinnane SAC confirmed its presence during the 2025 breeding season. The developer's assessment of curlew as a rarely recorded species subject only to collective evaluation cannot be reconciled with a national population of 105 breeding pairs.

4.2.8.3 Merlin — confirmed breeding on the adjacent SAC

Merlin is an Annex I species and a rare breeding raptor in Ireland. BirdWatch Ireland confirmed breeding merlin on Ballyduff/Clonfinnane SAC in May and June 2025, with the nest subsequently located. This is the most current field evidence available, postdating the developer's survey programme. A breeding pair at this location will

forage across an area that overlaps the proposed turbine zone. Disturbance during breeding, displacement from foraging habitat, and collision mortality risk to breeding adults are all directly relevant impact pathways that the EIAR does not adequately assess.

4.2.8.4 White-tailed eagle — approximately 150 individuals nationally

The entire wild white-tailed eagle population of Ireland comprises approximately 150 individuals (NPWS, 2025). The species was extinct in Ireland for over a century before reintroduction from Norway. A single confirmed collision fatality represents a loss of approximately 0.67% of the national population. The CRM produces a central estimate of 0.02–0.04 collisions per year — equivalent to 0.6–1.2 birds over the 30-year operational life of the wind farm. For a population of 150, individual-level irreplaceability makes the standard statistical thresholds designed for common species entirely inappropriate as an assessment tool.

4.2.9 Conclusion

The regulatory standards set out in this section — NPWS scoping requirements, NatureScot 2024 guidance, and DAU precedent from Carrig and Cush — establish a clear and demanding benchmark. The conservation status of the key species at risk establishes that the stakes are not ordinary. These are not common species at comfortable population levels where moderate uncertainty about survey methodology can be absorbed. They are species where individual-level losses carry national-level significance, where populations are already in unfavourable condition, and where the legal question is not 'how much harm is acceptable' but 'can adverse effects be excluded beyond reasonable scientific doubt.' Section 2 of this objection tests the survey programme against the benchmark established here.

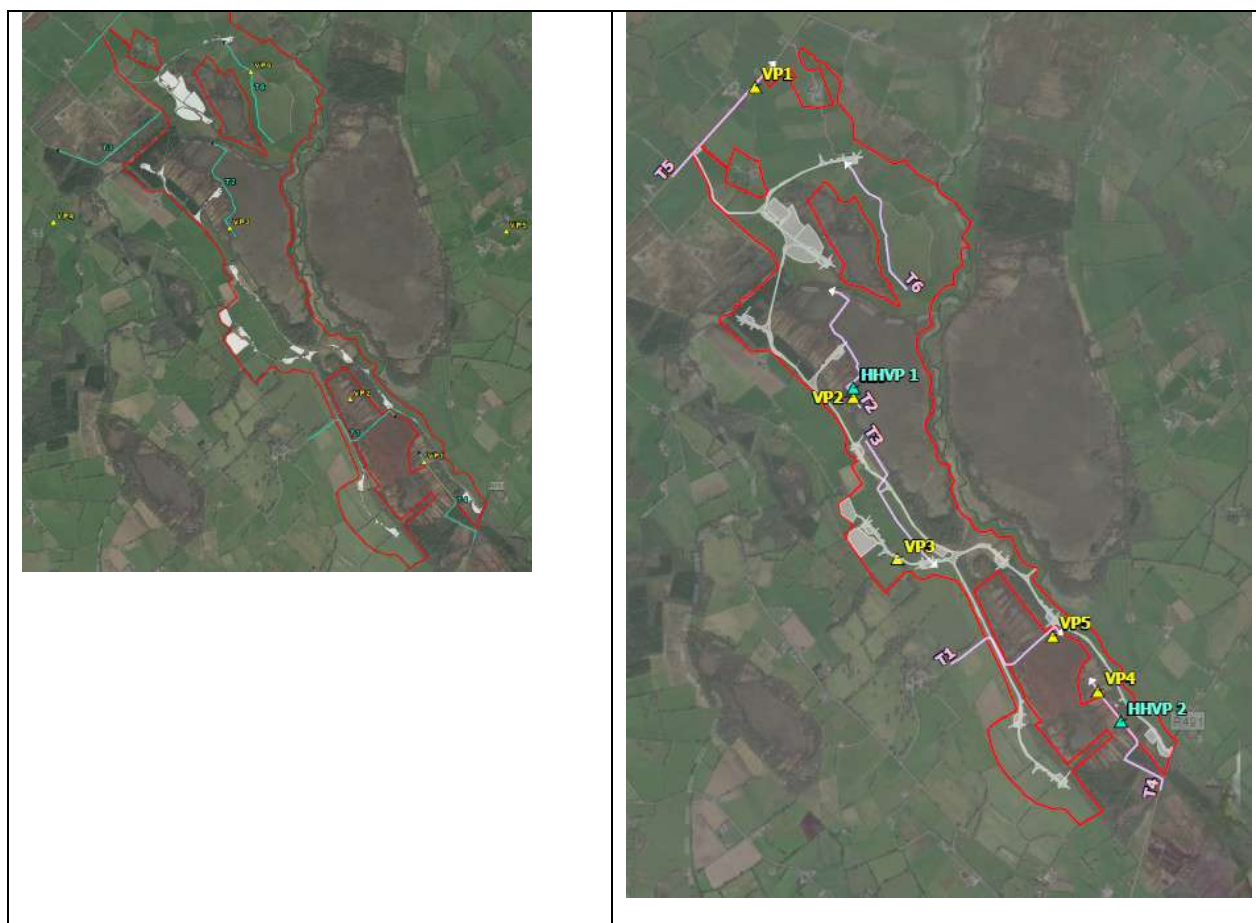
4.3: Survey Methodology: Effort, Coverage, and Gaps

This section is the forensic core of this chapter. It tests the survey programme against the benchmark established in the previous section. Detailed data in Appendices 4-1, 4-2 and 4-4 are relied upon. References to CRM are to Appendix 7-2 of the EIAR (Ballincor CRM, Gittings, 2025).

4.3.1 The Survey Dataset — A Critical Distinction

Before examining individual gaps, it is necessary to query both the stability and reliability of the survey dataset.

Ecology Ireland began survey efforts with five VPs (EI1–EI5) across the first four seasons. Two additional VPs were added mid-programme — EI6 and EI7 — covering the final four Ecology Ireland seasons. 2022 was absent from all surveys. An entirely separate and differently configured network (TB1–TB5) was deployed for the ninth season.



The stated reason for adding EI6 and EI7 is a change to the site boundary, but their positioning — oriented toward the River Brosna corridor and the wetland fields to the north and west, reveals that they disproportionately capture wetland bird movement along a corridor the original five-VP network was not covering; the assessment does not address the obvious question this raises, namely why additional corridor-facing VPs were needed if the original network was adequate. The chronology gives the appearance of a survey adapting as ecological gaps were progressively recognised rather than executing a pre-designed standardised strategy. A programme that modifies its network in response to identified deficiencies cannot credibly claim to have delivered a consistent, comparably structured dataset across all seasons.

The same rationale may explain the introduction of Tobin for an additional season. Although the Tobin survey effort was considered an improvement on previous efforts, Tobin did not include a Vantage Point from the Eastern side – EIS VP5 is not covered at all.

The CRM pools records from three distinct VP configurations as though they represent a coherent nine-season programme; they do not. They represent three phases of a programme that evolved, and that evolution is itself evidence that the earlier phases were not adequate standing alone. They are not equivalent. Understanding the difference and why the difference matters is essential to evaluating every finding that follows.

4.3.1.1 The Ecology Ireland dataset: 8 seasons, 2020–2024

The CRM states explicitly: 'The Ecology Ireland vantage point surveys were concentrated in the middle of the day.' Surveys did not classify flight activity by height bands, using instead four informal height ranges. No dawn or dusk coverage was achieved in summer. At sunset in winter, only 16 total minutes of survey effort were recorded across four seasons and all VPs. The methodology deviated from NatureScot guidance in multiple respects (CRM Section 1.5, Section 2.4.3.1).

4.3.1.2 The TOBIN dataset: 1 season, winter 2025/26

TOBIN conducted vantage point surveys across five VPs (TB1–TB5) during winter 2025/26 (October to February). The methodology followed NatureScot (2017/2025a) guidelines. Surveys covered full daylight hours from sunrise to sunset and additionally covered the hours before sunrise and after sunset as required for waterfowl. Flight activity was classified into five NatureScot-compliant height bands. VPs were surveyed on separate days to preserve statistical independence between observations. The CRM acknowledges that TOBIN coverage 'was more evenly distributed' with 'good coverage of the early morning and evening.'

4.3.1.3 Why the distinction is decisive

The TOBIN season represents **one** single winter. It contributes one of nine seasons to the combined dataset — approximately 11% of the total seasonal data. The remaining eight seasons, which form the overwhelming majority of the CRM's data inputs, are the Ecology Ireland seasons with their acknowledged methodological deficiencies. When

the CRM draws on the combined dataset to calculate collision risk, flight activity densities, and population-level mortality estimates, it is drawing primarily on a dataset the CRM's own author describes as concentrated in the middle of the day, non-compliant in methodology, and insufficient to calculate recording rates for the dawn and dusk periods. → *Appendix 4-4: VP Effort by Season*

The addition of one high-quality season does not retrospectively validate eight deficient seasons. It cannot fill the seasonal gaps (summer 2022 is absent entirely). It cannot provide breeding season dawn/dusk data. It cannot supply nocturnal coverage. It cannot provide radar or nocmig data. The TOBIN season improves one winter's data input. The remaining gaps are structural and cannot be corrected by the presence of one compliant season. → *Appendix 4-1: Dawn and Dusk Survey Coverage; Appendix 4-4: VP Effort by Season*

4.3.2 Vantage Point Spatial Coverage: CRITICAL Gap

4.3.2.1 Portion of the proposed development was never within sight of any survey station

A review of the vantage point viewshed mapping reveals a problem that predates any question of survey hours or methodology: a meaningful portion of the proposed development was never within sight of any survey station. No amount of additional survey time can compensate for a vantage point that cannot see the turbine it is supposed to be monitoring.

The CRM (Section 3.1.1.1) quantifies the scale of this problem. The Ecology Ireland 17m viewshed — mapped at the minimum turbine ground clearance height, the altitude most relevant to birds in the rotor-swept zone — covered only 62% of the 500m turbine buffer. At 30m, coverage improved to 85%. Three turbine locations presented specific and material problems: *Appendix 4-4, Spatial Coverage (Turbine-Level Coverage)*

1. T4: outside the Ecology Ireland 17m viewshed by approximately 40m. Covered at 30m only.
2. T5: outside both the 17m viewshed (by approximately 25m) and the 30m viewshed (by approximately 25m) in the Ecology Ireland dataset. Also outside the TOBIN 17m viewshed (by approximately 35m) and the TOBIN 30m viewshed (by approximately 10m). T5 is the only turbine outside all viewsheds at all heights across all nine survey seasons. Disturbance, displacement and collision mortality assessment at T5 is based entirely on modelling assumptions, with no direct empirical data at any height.
3. T6: approximately 200m from the Ecology Ireland 17m viewshed boundary — a substantial gap, not a marginal one. Approximately 25m from the 30m viewshed boundary. T6 falls within the TOBIN viewsheds, but TOBIN represents one winter season only.

The CRM responds to this by stating: 'the gaps in coverage are small and there are not any significant areas lacking coverage.' This characterisation is inconsistent with T6 being 200m outside the 17m viewshed and T5 being outside all viewsheds at all heights across the entire survey period. These are not marginal edge effects — they represent turbine locations for which the dominant dataset (Ecology Ireland, 8 seasons) provides no direct flight activity data at minimum turbine ground clearance height. → *Appendix 4-4, Sheet 3 — Part B: Turbine-Level Coverage*

A further spatial issue is identified in CRM Table 3.1: the proportion of total flight durations recorded within viewshed arcs at Ecology Ireland VPs varied from 40% at VP6 to 92% at VP7. At VP2, only 44% of recorded flight durations fell within the arc. At VP6, only 40% — meaning 60% of VP6's survey time was spent watching an area facing north, away from the wind farm site and the flooded River Brosna grasslands. The headline survey hours therefore significantly overstate effective coverage of the turbine buffer. → *Appendix 4-4: Flightlines Within vs Outside Arcs (Table of VP arc compliance).*

4.3.2.2 Vantage Point Coordinates and the Integrity of the Viewshed Analysis

The Collision Risk Model is built on viewsheds — the areas visible from each vantage point — and the entire model is only as reliable as those viewsheds are accurate. A viewshed is determined by three inputs above all others: the precise coordinates of the vantage point, the height of the observer's eye, and the flight height being assessed. If any of these is wrong, or simply unknown, the area the surveyor is assumed to have been able to see does not correspond to the area actually watched, and every figure derived from it — flight-line densities, collision estimates, the proportion of activity at rotor height — is compromised at source.

The vantage point coordinates have not been disclosed. As set out above, the survey logs were requested and not provided; but the omission goes further than the watch records. At no point in the Biodiversity Chapter, the Ornithology Chapter, Appendix 7-1, or the Collision Risk Model are the coordinates of the vantage points themselves presented. This matters because the NatureScot guidance is explicit that it is critical that the spatial coordinates of VP positions are measured to the highest level of accuracy using a GPS, and that the VP locations and associated viewsheds referred to in the environmental statement must be those used in the field. Without the coordinates, the viewsheds cannot be independently reproduced, and the competent authority is asked to accept the model's spatial foundation on trust.

The viewsheds appear to have been reverse-engineered rather than surveyed. The Collision Risk Model author records that the vantage point locations and initial viewshed arcs were supplied by Ecology Ireland and TOBIN, that the Ecology Ireland arcs did not align precisely with the VP coordinates, and that revised arcs were therefore generated to force geometric alignment. The model further records that the Ecology Ireland viewsheds had large overlaps, that watches were frequently carried out concurrently at overlapping viewsheds — duplicating spatial coverage and risking the same flight-lines being recorded at more than one point — and that many mapped flight-lines fell outside the arcs entirely, with more or less 360° distributions of flight-lines around some vantage points, against a NatureScot recommendation to scan an arc of no more than 180°. These are not the characteristics of vantage points sited by a

prior viewshed analysis; they are the characteristics of viewsheds fitted to vantage points after the fact.

Independent GIS analysis demonstrates how sensitive the result is to these unrecorded inputs. Dr Moran (Appendix 4-6) undertook viewshed analysis in ArcMap using a 25 cm photogrammetric digital surface model, and demonstrated three points directly relevant to this application. First, on position: three vantage points separated by less than 50 metres — the order of error that arises where a location is taken from a map or from a smartphone rather than a survey-grade GPS — produce materially different viewsheds with all other variables held constant, so an undisclosed or imprecise coordinate changes the area the surveyor is assumed to have seen. Second, on observer height: the visible area differs substantially between an observer eye-height of, for example, 135 cm and 185 cm — the difference between a short and a tall surveyor, exacerbated where an observer sits or lies during a long watch — and there is no indication that observer height was standardised or accounted for, notwithstanding that some Ecology Ireland watches extended over a six-hour period during which the observer would have had to remain motionless at a fixed height. Third, on flight height: when the viewshed is generated for a flight height of 10 metres — a common commuting height for Whooper Swan — large areas of the site over which birds pass at or below that height fall outside the visible area altogether, so birds commuting low through the development zone would not reliably have been seen, would not have been recorded, and do not appear in the model.

The consequence is specific. The viewshed analysis purported to assess birds flying within the potential rotor-sweep, but it did not generate viewsheds for the low commuting heights at which Whooper Swan in particular habitually move between roosting and foraging sites. Combined with the near-absence of surveys at the low-light periods when these movements occur, this is likely to have produced a material under-estimate of the number of birds of this Annex I qualifying interest commuting through the proposed wind farm.

This is a survey-design failure, not a data-quality quibble. The distinction is important. A data-quality challenge can, in principle, be met by the developer's standard answer that conservative assumptions were applied. A defect in the spatial design of the survey cannot be cured that way: if the vantage points were not sited, recorded and reproduced to the required standard, the viewsheds do not describe what was actually watched, and no downstream assumption — however conservative — can reconstruct activity in areas that were never visible to the surveyor in the first place. As Dr Moran concludes, the Collision Risk Model, although it applies precautionary assumptions, is based on fundamentally flawed ornithological surveys and as such cannot be considered to be a scientifically robust assessment of the potential impact of the proposed wind farm on the local avifaunal resource.

The detection assumptions built into the viewshed analysis are also undermined by the published work of the Collision Risk Model's own author. A 2 km viewshed radius was used for the Ecology Ireland analysis. Dr Gittings, who prepared the Collision Risk Model, has himself published (Gittings, 2024, In Practice 126, 40–44) that the largest declines in detection rates occur at distances of more than 1000 m from the vantage point, and that 1 km viewsheds are likely to produce much more accurate vantage point survey results than the current industry standard of 2 km viewsheds. The model therefore relies, for a substantial part of its assumed coverage, on a viewshed radius that its own author has identified in the peer-reviewed literature as materially less accurate than the alternative. Activity recorded — or, more importantly, missed — in the outer reaches of a 2 km viewshed cannot be assumed to have been detected at the rates the model implies.

4.3.3 Dawn and Dusk Coverage: CRITICAL Gap

Dawn and dusk coverage is structurally absent from summer; near-zero at dusk in winter.

The CRM (Section 3.4.3 and Tables 3.8–3.9) provides the diel distribution of survey effort. This data — the developer's own — demonstrates a structural absence of coverage during the periods most ecologically significant for the SPA qualifying

interest species. The figures below are drawn directly from CRM Tables 3.8 and 3.9 and are examined in full in Appendix 4-1. → *Appendix 4-1, Tables A.1 and A.2: Summer and Winter Diel Effort (from CRM Tables 3.8 and 3.9)*

Summer (Ecology Ireland, 4 seasons combined)

- At sunrise: 0 survey minutes across all VPs and all four summer seasons.
- In the hour after sunrise: 15 total minutes across all VPs and all four seasons — an average of less than 1 minute per VP per season.
- At sunset and in the two hours before sunset: 0 survey minutes.
- At two hours before sunset: 0 survey minutes.

CRM conclusion on this data: 'In summer there was no survey coverage during the first hour after sunrise or the two hours before sunset, and only 15 minutes of survey effort (across all vantage points and survey seasons) in the 1–2 hour period after sunrise.' → *Appendix 4-1, Table A.1: Summer Survey Effort by Time Period*

Winter (Ecology Ireland, 4 seasons combined vs TOBIN 1 season)

- Ecology Ireland — pre-dawn (hour before sunrise): 152 total minutes across 4 winters. TOBIN — 612 minutes in one winter alone. TOBIN's single season captures four times the pre-dawn effort of four Ecology Ireland winters combined. → *Appendix 4-1, Table A.2: Winter Survey Effort — Ecology Ireland vs TOBIN*
- Ecology Ireland — at sunset: 16 total minutes across 4 winters (approximately 0.1 minutes per daylight hour). TOBIN — 869 minutes in one winter. → *Appendix 4-1, Table A.2: Winter Survey Effort (row: Sunset)*
- Ecology Ireland — post-dusk (hour after sunset): 0 minutes across all 4 winters. TOBIN — 538 minutes in one winter. → *Appendix 4-1, Table A.2: Winter Survey Effort (row: Sunset – 1 / post-dusk)*

CRM conclusion: 'There was not sufficient survey effort to calculate recording rates for the AM1 period in summer or for the PM1 period in both seasons.' This is a self-admission that the model cannot assess crepuscular activity from the dominant dataset. → *Appendix 4-1, Section 5: Conclusions (Conclusion 1 and 2); Appendix 4-2, Entry A6.*

The significance of these absences is not merely methodological. The CRM itself notes (Figure 3.6) that Whooper Swan and Mute Swan showed higher recording rates in the early morning in the Ecology Ireland winter dataset — 'which could have been due to birds commuting from nocturnal roost sites.' The CRM further acknowledges (Section 4.7.2.5) that 'uneven diel coverage may have caused under-estimation of Cormorant and (possibly) Whooper Swan collision risk.' The dawn and dusk periods are not optional survey windows — they are the peak activity periods for the species at greatest risk. → *Appendix 4-1, Table A.4: Dawn and Dusk Significance by Priority Species (rows: Whooper Swan, Golden Plover)*

For curlew, the dawn period covers peak territorial display by breeding males — the very behaviour that would confirm breeding presence. For golden plover, pre-roost flocking and roost departure are crepuscular events involving the largest aggregations — the events most relevant to collision mortality risk. For Greenland white-fronted goose, roost commuting in pre-dawn darkness is the primary movement pattern. None of these activity periods are captured in the Ecology Ireland dataset, which provides the dominant data input to the CRM. → *Appendix 4-1, Table A.4: Dawn and Dusk Significance by Priority Species (rows: Curlew, Golden Plover)*

4.3.4 The Brosna Corridor: Highest Bird Densities Excluded from the CRM — CRITICAL Gap

The CRM (Section 3.3.2 and Table 3.4) identifies a structural feature of bird use at the Ballincor site that is of direct relevance to the collision risk assessment: the River Brosna corridor divides into a northern section and a southern section, with markedly different bird activity densities. The northern section — the Brosna North Corridor — has the highest flight activity densities for multiple SPA qualifying interest species anywhere in the survey area. The CRM then excludes those densities from the collision risk model. The consequence is that the CRM modelling collision risk for the turbines is built on data from the lowest-activity zone, while the highest-activity zone is set aside.

4.3.4.1 What the CRM's own data shows

CRM Table 3.4 provides flight activity densities at potential collision height (birds/km²/month) for the North Corridor, South Corridor and the remainder of the survey area. The following figures are drawn directly from that table at the 17m viewshed height — the minimum turbine ground clearance, most relevant to collision risk:

- Whooper Swan: North Corridor 901 birds/km²/month — 4.7× the remainder density of 191
- Wigeon: North Corridor 8,434 — 8.0× the remainder of 1,058
- Lapwing: North Corridor 7,845 — 5.8× the remainder of 1,363
- Black-tailed Godwit: North Corridor 10,573 — 3.1× the remainder of 3,377

All four of these species are SPA qualifying interests of the River Little Brosna Callows SPA. For three of them — Whooper Swan, Wigeon and Lapwing — the CRM explicitly states that densities in the South Corridor "were not higher than elsewhere in the survey area." This means for those species, the CRM models collision risk from the remainder category — the lowest density zone — while excluding both the highest-density zone (North Corridor) and the medium-density zone (South Corridor) from the core calculation.

4.3.4.2 The CRM's rationale and why it is insufficient

The CRM modeller excluded the Brosna North Corridor from the spatially-structured models on the stated basis that "there are no turbine locations within, or close to, the northern part of the Brosna corridor" (CRM Section 2.5.3). Birds feeding in the North Corridor do not remain there. They commute south — through or over the wind farm footprint — to reach the South Corridor feeding grounds, the wider landscape, and their roost sites. Those commuting flights, in a zone where eleven turbines will be operating, generate collision risk. The in-situ North Corridor density figures are excluded from the CRM; the commuting flight activity those densities imply is not

separately modelled. No commuting flight analysis was conducted for birds moving between the North Corridor and the turbine zone. The exclusion of the North Corridor therefore removes the most ecologically active part of the site from the collision risk assessment without replacing it with any equivalent analysis of commuting flight exposure. → CRM Section 2.5.3 and Table 3.4; Appendix 4-4, Sheet 3 — Part A: Spatial Structure.

4.3.4.3 The annual flooding variability problem

A further consequence of the North Corridor exclusion is identified by the CRM itself (Section 4.7.2.3): *"for several waterbird species, there may be large annual variation driven by flooding patterns associated with water levels in the Little Brosna River."* In good flooding years — when the North Corridor fields are extensively inundated — bird concentrations in that zone will peak well above the mean densities in Table 3.4. The exclusion of the North Corridor from the CRM means that peak-year densities in the highest-activity zone do not appear in the collision risk calculations. The CRM's central estimates therefore reflect average conditions in the lowest-activity zone and do not capture the elevated risk in peak flooding years. → CRM Section 4.7.2.3; Appendix 4-2; North Corridor exclusion — annual variability.

4.3.4.4 The South Corridor: a separate concern

For Whooper Swan, Wigeon and Lapwing, the South Corridor densities are not treated separately in the spatially-structured models because the CRM found them similar to the remainder. However, the South Corridor contains two turbine locations and is the section of the River Brosna closest to the proposed structures. For those two turbine locations, birds moving along the river at collision height are directly exposed. The CRM modelling for these species treats the South Corridor and the rest of the site as a single uniform density zone, based on the remainder figure — which, for Wigeon at 17m, is 1,058 birds/km²/month, compared to 8,434 in the North Corridor a short distance upstream. The modelling does not distinguish between the different species composition or flight behaviour of birds in the South Corridor versus the remainder of the site. For a species such as Wigeon — a nocturnal feeder with peak flight activity at

dawn and dusk, and with the highest density concentration upstream of the turbine zone — this conflation understates the specific exposure at the river corridor turbine locations. → CRM Table 3.4; Appendix 4-2, South Corridor spatial treatment.

4.3.4.5 The combined effect

The combined consequence of the North Corridor exclusion, the South Corridor conflation, and the absence of a commuting flight analysis is that the CRM for Whooper Swan, Wigeon, Lapwing and Black-tailed Godwit — all SPA qualifying interests — is built on flight activity data from the survey area's lowest-density zone, while the area of highest density is excluded, the intermediate zone is not separately treated for three of the four species, and the commuting movements that connect the high-density feeding area to the turbine zone are unquantified. This is not a marginal methodological point.

For the species most concentrated in the North Corridor, the collision risk estimates in CRM Table 4.1 may be substantially lower than estimates based on the actual movement patterns of the birds using the site. That conclusion is supported by the CRM's own distance correction factors: at 1.52–1.80× for Whooper Swan and 2.65–2.88× for Wigeon (CRM Table 4.6), the CRM modeller acknowledges that the current central estimates already understate collision risk by those factors without applying the under-detection correction. The corridor exclusion compounds this further. → Appendix 4-2, A10: CRM Limitations

The raw data in Appendix 7-1 shows that a substantial proportion of wetland bird records along the River Brosna corridor are at very low altitudes — 2.5m, 5m, 10m and 15m — including Whooper Swan, Mallard and Grey Heron, consistent with birds commuting low along drainage features and riverbanks between feeding areas and roost sites. This matters for detectability: a bird flying at 2.5m above a watercourse at 800–1,000m range from a VP is substantially harder to detect than a bird flying at 100m in open airspace at the same range, yet the CRM's distance correction factors are derived from general distance-decay analyses across the full viewshed and are not calibrated to the low-altitude corridor flights that dominate the North Corridor

records. The species most concentrated in the corridor are therefore flying at precisely the altitudes most subject to detectability limitation at range, meaning the under-detection problem the CRM acknowledges but excludes from its central estimates is likely to be greatest for the species that matter most. Combined with the North Corridor exclusion from the CRM and the absence of dawn and dusk coverage, the true collision exposure for corridor-associated species is underestimated in three compounding and directionally consistent ways. → CRM Section 5.3 and Table 4.6; Appendix 7-1 A and C.

4.3.5 Breeding Bird Coverage — Merlin and Curlew: CRITICAL Gap

The Ecology Ireland breeding surveys (2020, 2021, 2023, 2024) recorded merlin in breeding seasons 2023 and 2024 and in all four winter seasons. Curlew was recorded in breeding season 2023 and in winter 2020/21. Both species had fewer than 10 records across the survey period and were assessed collectively with other rarely recorded species at 'local importance (higher value).' No targeted breeding surveys using appropriate methodology were conducted for either species. The EIAR notes no confirmed breeding for either species within the development zone. → *Appendix 4-3, SectionC4.3: Merlin (recorded presence in Zol); SectionC4.2: Curlew (recorded presence in Zol)*

4.3.5.1 BirdWatch Ireland findings — Ballyduff/Clonfinnane SAC, May and June 2025

BirdWatch Ireland undertook breeding bird surveys on Ballyduff/Clonfinnane Bog SAC in May and June 2025, using passive acoustic monitoring (ARUs) deployed around the perimeter of the SAC. The surveys ran for five days (31 May, 1, 2, 3, and 4 June 2025). All recordings were analysed using RavenPro 2.0. The findings are unambiguous:

- Breeding Merlin (*Falco columbarius*) confirmed. The nest was subsequently located.
- Curlew (*Numenius arquata*) confirmed present during the breeding season.
- Kestrel (*Falco tinnunculus*) confirmed present.
- A wide range of other species recorded.

Ballyduff/Clonfinnane Bog SAC is located approximately 2.8km northwest of the proposed Ballincor wind farm site. The confirmed breeding pair of merlin on the SAC will forage across a range that extends 2–3km from the nest during the breeding season, placing the proposed turbine zone directly within the foraging range of breeding adults. → *Appendix 4-3, SectionC4.3: Merlin — recorded presence in Zone of Influence (foraging range analysis)*

4.3.5.2 The significance of this evidence

The survey methodology used passive acoustic monitoring with ARU deployment which is precisely the technology NatureScot 2024 recommends and the NPWS/DAU required for the Ballincor submission. Its absence from the Ballincor programme meant that equivalent evidence was not gathered.

The developer's inference that low recording rates during VP surveys indicate 'limited reliance on the area' for merlin is directly contradicted by confirmed active breeding within the foraging range of the development zone, detected using appropriate methodology.

For curlew — with approximately 105 breeding pairs nationally — confirmed presence during breeding season on a SAC within 3km of the development constitutes evidence of a potential breeding pair in the Zone of Influence. The developer's collective assessment at 'rarely recorded' level is inadequate for a species at this national population level.

Neither the EIAR nor the NIS provides a breeding disturbance assessment for merlin or curlew at turbine-zone distances. Research documents avoidance distances of up to 800m for curlew from operational turbines and sensitivity of merlin to disturbance during incubation and chick-rearing. These assessments are absent. → *Appendix 4-3, SectionC4.2: Curlew — developer assessment and gaps (displacement distances); SectionC4.3: Merlin*

The most current field evidence available to An Coimisiún Pleanála — the May/June 2025 BirdWatch Ireland breeding bird survey — confirms active breeding of Annex I species (merlin) and a Red-listed nationally critical species (curlew) on the SAC immediately adjacent to the Ballincor development. A breeding merlin pair nesting on the adjacent SAC, with a foraging range overlapping the turbine zone, engages the Article 6(3) disturbance and displacement pathway directly. The developer's treatment of merlin as a rarely recorded species subject only to collective assessment is not tenable.

4.3.6 Absence of Nocturnal Surveys: CRITICAL Gap

Nocturnal surveys — entirely absent across all nine seasons for all species

No nocturnal surveys were conducted at any point across the nine-season Ballincor ornithological programme. This is an absolute absence, not a partial gap. The NPWS/DAU submission on the Carrig application — in the same shared ecosystem — stated explicitly: 'No nocturnal surveys of migration or nocturnal commuting movements of wildfowl over or in the zone of influence of the site. A range of wildfowl known to carry out movements at night, which the daylight surveys would have missed... The Department's view is that the full impact of the development cannot be assessed without this information.' → *Appendix 4-2, Entry A6: CRM admission — insufficient effort for PM1/AM1; Entry E1: Nocturnal activity rankings*

This statement applies without qualification to Ballincor. The species for which nocturnal movements are most relevant include:

- Whooper swan — commutes between nocturnal roost sites and feeding grounds in pre-dawn darkness. The Sharragh NPWS roost (confirmed by the Oran Ecology / Hektor submission) lies within the shared Zone of Influence. Pre-dawn departure from this roost on the flightline toward the River Little Brosna SPA is entirely unrecorded across all nine seasons. → *Appendix 4-1, Table A.4: Whooper Swan — crepuscular/nocturnal activity pattern and survey gap*
- Golden plover — large winter flocks exhibit nocturnal and crepuscular movements between feeding and roosting areas. The CRM applies a nocturnal activity ranking of 2

(25% nocturnal activity rate) using literature values, not site data. → *Appendix 4-1, Table A.4: Golden Plover — nocturnal activity pattern; Appendix 4-2, Entry E1*

- Greenland white-fronted goose — roost commuting occurs in pre-dawn darkness. The tagged individual recorded by a University of Saskatchewan PhD researcher passing within 6km of the Cush Wind Farm site during migration demonstrates connectivity between the known GWfG roost sites and the Zone of Influence — a movement that would occur at night.
- Curlew, lapwing, black-tailed godwit, wigeon, teal, mallard — all assigned nocturnal activity corrections in the CRM, all based on literature values because no nocturnal site data exists.

The CRM applies nocturnal activity corrections to seven species as a modelling substitute for empirical nocturnal data. These corrections necessarily introduce assumed values where measured values are required. NatureScot 2024 guidance recommends nocturnal survey effort where nocturnal activity is relevant. The DAU's explicit requirement that nocturnal surveys be conducted for this landscape type has not been met. → *Appendix 4-2, Entry E1: CRM nocturnal ranking limitations (CRM Section 2.6.7.3)*

4.3.7 Absence of Acoustic Monitoring and Nocmig - ABSENT

Acoustic monitoring / nocmig — not conducted across all nine seasons

No acoustic monitoring — either passive daytime recording or nocturnal migration (nocmig) monitoring — was conducted across any of the nine survey seasons. The NPWS/DAU Carrig submission states: 'Acoustic recording of calls from migrating birds over fixed points at night (nocmig) is now widely used and should be used to indicate bird usage in the zone of influence of the proposed development.' NatureScot 2024 recommends nocmig deployment as a tool for quantifying bird activity during the periods not covered by vantage point surveys. → *Appendix 4-2, Entry A6: diel coverage self-admission; Appendix 4-3, Section C4.3: Merlin — acoustic methodology gap*

The relevance of this absence was demonstrated by the 2025 BirdWatch Ireland breeding bird survey on Ballyduff/Clonfinnane SAC. That survey deployed six Autonomous Recording Units (ARUs — Song Meter Micro 2, Wildlife Acoustics) around

the perimeter of the SAC for five days in May and June 2025. Analysis of the recordings using RavenPro 2.0 confirmed the presence of breeding merlin, with the nest subsequently located. The same methodology also confirmed curlew and kestrel presence. This is precisely what acoustic monitoring was designed to detect — species that are active at times or in habitats where vantage point surveys are insufficient. The absence of this technology from the Ballincor survey programme means that equivalent findings on or adjacent to the Ballincor development zone were not and could not be made.

4.3.8 Temporal Effort — Hours per VP per Season: SIGNIFICANT Gap

The analysis reveals a Significant Gap with Temporal effort below NatureScot minimum in three summer seasons and entirely absent in 2022.

The CRM (Table 2.1) shows that in six of the eight Ecology Ireland seasons, 36 hours of watches were completed at each VP, while in the other two seasons 30 hours were completed. NatureScot 2024 requires a minimum of 36 hours per VP per season. El1–El5 therefore fell below this minimum in summer 2020, summer 2021, and summer 2024 (30 hours each). Summer 2023 achieved 36–37 hours at El1 and 36 hours at El2–El7. → *Appendix 4-4, VP Effort by Season (Table of hours per VP per season, Section B: NatureScot comparison)*

More seriously, summer 2022 is entirely absent from the dataset. The CRM states (Section 2.3.1): 'The flight activity data used for the collision risk model comprised a nine-season vantage point survey carried out between summer 2020 and summer 2024, with the exception of summer 2022.' No explanation is provided for this omission. An entire breeding season — four months of curlew territorial behaviour, merlin breeding, and breeding wader activity — is absent from the dataset without explanation. → **Appendix 4-4: VP Effort by Season**

A further issue with temporal effort concerns concurrent watches. The CRM (Section 3.2.1) states that over 50% of Ecology Ireland survey days included concurrent watches at all VPs, with a further 20% at all but one. Given the large overlaps between

Ecology Ireland viewsheds, the predominance of concurrent watches 'created significant issues for the statistical independence of the flight activity sampled at each vantage point.' The CRM acknowledges this directly. TOBIN in its ONE season surveys VPs on separate days, preserving independence. → **Appendix 4-2, Entry A9:**

Concurrent watches — statistical independence (CRM Section 3.2.1)

Expert review by Dr Pat Moran Appendix 4-6 has identified a separate breach of the NatureScot requirement that VP survey must not take place simultaneously with any other fieldwork on the site, as it may cause disturbance and invalidate the VP survey results. Dr Moran establishes that, on 27 June 2023, a minimum of three vantage point surveys were undertaken at the same time as aquatic surveys were being conducted on the site. The absence of a survey schedule for either programme prevents the Group from establishing how systematically this occurred; but the developer's own records confirm it occurred at least once, on a date when three of the vantage points were affected. On the NatureScot standard, the affected watches — and any Collision Risk Modelling derived from them — are liable to be invalidated. This is a distinct defect from the concurrent-watch issue addressed above: there, the concurrency is between vantage points; here, it is between the vantage point surveys and unrelated fieldwork that the guidance states must not run alongside them.

4.3.9 Survey Seasonality — Whooper Swan and Curlew Breeding Gaps - SIGNIFICANT Gap

4.3.9.1 Whooper Swan — winter coverage and seasonal absence

Whooper swan is a winter visitor to Ireland, present from October to March. All surveys outside winter seasons therefore cannot record whooper swan. Of the nine seasons: four Ecology Ireland breeding seasons and one TOBIN winter provide coverage. The four Ecology Ireland breeding seasons record no whooper swans — the species is simply absent. The four Ecology Ireland winter seasons record the species but with the dawn and dusk coverage gaps documented in Section 2.4. The TOBIN winter season provides the only dawn/dusk-compliant data for whooper swan — one season.

The CRM applies a nocturnal activity correction for whooper swan (waterfowl correction adding 2 hours to the daylight period). This correction is based on literature values, not site data, because the Ecology Ireland surveys did not capture the periods during which nocturnal and crepuscular activity would have been recorded. The TOBIN season did not show higher recording rates in the early morning — but this is interpreted by the CRM as suggesting lower crepuscular activity, not as confirmation that such activity is absent. One season cannot be definitive on this point. → *Appendix 4-1, Table A.4: Priority Species — Whooper Swan (nocturnal activity pattern and survey gap)*

4.3.9.2 Curlew — breeding season coverage and the 2022 gap

Curlew breeding season runs from approximately March to July. Breeding territories are established from March and territorial calling begins at dawn. Four Ecology Ireland breeding seasons (2020, 2021, 2023, 2024) provide some coverage but with zero dawn coverage in summer — precisely the period when territorial curlew activity is most detectable. Summer 2022 is entirely absent, removing one complete breeding season from the record. → *Appendix 4-1, Table A.3: Season-by-Season Summary (EI Summer rows — dawn/dusk coverage ~0%)*

The national breeding curlew survey (NPWS, 2021) recorded a probable breeding curlew in the region of the Arragh More Bog NHA and Kilcarren-Firville Bog SAC to the southwest of Sharragh — within the shared Zone of Influence.

4.3.10 Environmental Condition Data — The Scoping Requirement That Was Not Met SIGNIFICANT GAP

The NPWS scoping response placed a specific and itemised requirement on the applicant: records must be supported by "basic environmental data such as hourly estimates of visibility, glare arcs, cloud cover and precipitation during Vantage Point (VP)/Walkover Survey periods." This requirement exists so that survey data can be independently verified against the conditions in which it was collected. It is not a presentational standard — it is an evidential one. Without it, the competent authority

cannot assess whether detections or non-detections during any given watch reflect actual bird activity or the conditions in which the survey was conducted.

Chapter 7 and its appendices do not contain this data. A review of Appendix 7-1 — the raw vantage point data submitted with the application — confirms that the data columns present are: date, time, species, abundance, duration of observation, initial flight height, duration within application site, and off-site duration. There is no column for visibility, cloud cover, precipitation or glare arc. These data were either not recorded or not submitted. Either outcome fails to meet the scoping requirement.

This presents 3 practical consequences:

1. The 11% of Ecology Ireland watches conducted in reduced visibility cannot be independently verified. The CRM author (App 7-2, Section 3.2.3) acknowledges that "both sets of vantage point surveys included some watches with reduced visibility where the full 2km viewsheds at potential collision height were not fully visible. These comprised 11% of the Ecology Ireland watches and 7% of the TOBIN watches." The CRM modeller excluded these watches from one version of the dataset. But because no watch-by-watch visibility record was submitted, the decision about which watches to exclude is not auditable from the submitted data. An Coimisiún Pleanála cannot verify how those 11% were identified, which watches they correspond to, or whether the identification was consistent and complete. The raw condition data that would allow this verification does not exist in the submitted application.
2. Glare arc data is absent — a gap of particular significance for dawn and dusk coverage. Glare arcs define the periods within each survey day when low sun angle renders part or all of the viewshed unusable for detection. Their absence means it is impossible to assess what proportion of the limited dawn and dusk coverage that did occur — identified in this objection as the most ecologically significant periods for the priority species — was conducted in conditions where detection of flying birds was actually possible. In the absence of glare arc records, the survey effort tables in CRM Tables 3.8 and 3.9 cannot be read as reliable measures of usable observation time during the critical early morning and late evening windows. → *Appendix 4-1, Tables A.1 and A.2: Diel Survey Effort Distribution.*
3. Precipitation and cloud cover data were not submitted, removing the ability to quantify independently the proportion of survey time conducted in conditions of reduced

avoidance capacity. This is not a theoretical concern. The NPWS/DAU submission on the Carrig Wind Farm application — in the same shared ecosystem — stated directly: "The Department can find no detailed reference in the assessment, quantifying the likely number of nights of fog, low cloud ceiling or precipitation at the site based on previous weather patterns." The DAU identified this as material because, as that submission continued, "low visibility events — such as fog or heavy rain — are likely to greatly reduce the ability of species to avoid danger areas." A survey programme from which precipitation and cloud cover data are absent cannot provide the basis for quantifying that risk.

The NPWS scoping response set these requirements in advance of the survey programme. The developer was aware of them. Their absence from the submitted application is not a minor presentational shortfall — it means that the quality of the survey data on which the entire CRM rests cannot be independently audited against the environmental conditions in which it was gathered. The CRM's own treatment of non-compliant watches depends entirely on the CRM author's internal assessment of conditions that were not systematically recorded. That is not a standard that meets the NPWS's explicit requirement for data capable of independent verification.

4.3.11 CRM Self-Identified Gaps

The CRM document itself acknowledges a significant number of limitations, caveats, and uncertainties in the survey dataset and the model built from it. These are not minor qualifications — they include statements that the model cannot calculate recording rates for key time periods, that survey methodology deviated from guidance in multiple respects, that distance under-detection would increase collision estimates by factors of 1.5–3 if included, and that uncertainty due to avoidance rate uncertainty is excluded from the reported ranges. A full catalogue of 25 such entries — each with CRM section and page reference — is provided in Appendix 4-2 of this objection. The following are the most significant: → *Appendix 4-2: CRM Self-Identified Limitations — Full Catalogue (25 entries with CRM page references)*

- CRM Section1.5: 'The methodology of most of the vantage point surveys carried out for this project deviated in a number of respects from the recommended methodology (NatureScot, 2025a).'
- CRM Section3.4.3: 'There was not sufficient survey effort to calculate recording rates for the AM1 period in summer or for the PM1 period in both seasons [Ecology Ireland dataset].'
- CRM Section4.7.2.5: 'Uneven diel coverage may have caused under-estimation of Cormorant and (possibly) Whooper Swan collision risk.'
- CRM Section5.3: 'The uncertainty ranges did not take account of potential under-detection of distant flightlines. Inclusion of this factor would raise the mortality increases by factors of around 1.5–3 times.'
- CRM Section5.3: 'The uncertainty ranges also did not take account of uncertainty due to limited knowledge of avoidance rates.'

These admissions are the developer's own. They establish that the CRM outputs are not complete, precise, and definitive as required by Article 6(3) of the Habitats Directive and the legal standard in Case C-127/02 (Waddenzee). See Appendix 4-2 for the complete catalogue with cross-references to the sections of this chapter where each admission is challenged. → *Appendix 4-2: Cross-Reference Summary table*

Deeper investigation of Appendix 7-1 reveals real issues with the raw data

- Height estimation was collapsed into category midpoints. The value 62.5m appears as the recorded flight height across dozens of records spanning multiple species, seasons and VPs. It is not a plausible product of independent estimation — it is a category midpoint. The same applies to 2.5m, which recurs across Whooper Swan, Mallard and Grey Heron records at multiple VPs and seasons. Where height recording has defaulted systematically to a small number of repeated values, the altitude distribution inputs to the CRM cannot be considered reliable. The CRM is highly sensitive to this variable: the proportion of flight time assigned to the collision risk zone is directly determined by these records.

- Duration fields are missing or anomalous in a non-trivial number of records. Examples include the Golden Plover record at VP5 on 14/03/2022 (450 birds, 25m, off-site duration "Unknown"); Mallard WT45-24 at VP1 on 31/05/2024 (duration of observation and duration within application site both "Unknown" at 2.5m); and two consecutive Buzzard entries at VP1 on 23/09/2024 carrying a dash in the duration field and "Unknown" in the height field. 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.
- Extreme duration records are not accounted for in the CRM methodology. The appendices contain records of 750 seconds (Buzzard, RP189-24), 840 seconds (Golden Plover, WD23-20/21, 28 birds), 900 seconds (Mallard, WT31-24, entirely within site at 2.5m) and 1,200 seconds (Mallard, WT127-23, entirely within site at 0m). Fifteen to twenty minutes of continuous observation is not consistent with a bird transiting the survey area — it represents feeding, loafing or circling within the VP envelope. For a 28-bird golden plover flock observed for 840 seconds, the treatment decision is material to the aggregate collision estimate.

The precision implied by the CRM's outputs is not supported by the underlying data. Decimal-place collision estimates built on height records systematically rounded to category midpoints, unknown duration fields, and extreme observations of undisclosed treatment do not constitute the complete, precise and definitive evidence base that Article 6(3) requires. This is a further dimension of the uncertainty that CRM Section 5.3 acknowledges is not fully reflected in the reported ranges. → Appendix 7-1 A, B and C; CRM Sections 2.4.1 and 5.3.

These admissions are the developer's own.

4.3.12 Conclusion

The survey programme has a cumulative effect that goes beyond the sum of its individual gaps. Every major deficiency presented shares a common characteristic: it removes or suppresses data from the periods and places where bird activity is highest and collision risk is greatest. Dawn and dusk surveys are absent across eight summers

and near-absent across four winters — precisely when whooper swan, golden plover, curlew and Greenland white-fronted goose are most active. The North Corridor, with densities four to eight times higher than the modelled zone for four SPA qualifying species, is excluded from the CRM entirely. Nocturnal surveys, acoustic monitoring and radar are absent across all nine seasons. Turbine T5 has no empirical data at any height across any season. Summer 2022 is missing without explanation. The only methodology that would have detected confirmed Annex I breeding within the foraging range of the development was never deployed.

The pattern is consistent and directional. Taken together, the gaps produce a dataset that systematically under-samples the highest-risk scenarios and oversamples the lowest: mid-day, dispersed flight activity in the lowest-density zone of the survey area. The CRM then uses those suppressed figures as inputs, produces estimates that fall below the 1% annual mortality threshold, characterises the threshold as highly precautionary, and concludes that adverse effects are negligible. The circularity is complete: a dataset structured to undersample peak risk produces low collision estimates; low collision estimates are used to demonstrate safety; the assessment is described as conservative.

This circularity is compounded by the progressive complexity the CRM is required to deploy to compensate for the dataset's instability — spatially structured models for three different VP configurations, distance correction factors of 1.52–2.88×, diel corrections for missing dawn and dusk periods, and literature-derived nocturnal rankings for seven species in the absence of any site-specific nocturnal data. Each analytical step is defensible in isolation. Together they reveal a modelling framework that is not processing a coherent dataset but actively reconstructing an unstable one. The complexity is not confirmation of rigour — it is a measure of how much analytical ground the model is being asked to cover for a dataset that did not deliver it.

The CRM's own author makes the consequence explicit: applying the distance under-detection corrections he excluded from the central estimates would raise collision mortality figures by factors of 1.5 to 3 times across all species — sufficient, for several species, to breach the 1% threshold the developer uses as its primary demonstration of

safety. He further acknowledges potential under-estimation of whooper swan collision risk, exclusion of avoidance rate uncertainty from the reported ranges, and that the black-tailed godwit assessment is "not robust."

The Habitats Directive requires the competent authority to ascertain — not merely suspect — that adverse effects can be excluded, and ascertainment requires complete, precise and definitive data. The survey programme delivered what nine seasons of mid-day concentrated surveys, with no nocturnal component, no acoustic monitoring and no dawn or dusk coverage in summer, could reasonably be expected to deliver: a reliable characterisation of bird activity during the lowest-risk period of each day, in the lowest-density zone of the site, for species detectable by conventional daylight observation. That is a partial picture. The picture must be complete. It is not.

4.4 Analysis, Reasoning and Conclusions — Credibility

Section 4.3 demonstrated that the survey programme fails to meet the standards established in Section 4.2 across a host of identified gaps, many of them critical. The conclusion of Section 2 is that the dataset cannot support ascertainment. Despite the unacceptable survey effort, the surveys delivered what they delivered and this section accepts that dataset as delivered and asks a different question: does the analysis itself hold up? Does the reasoning from data to conclusion follow? Where the CRM and EIAR acknowledge limitations, are those limitations honestly carried through to the conclusions? And does the developer's mitigation framework provide any backstop against the gaps in the assessment?

The answer to each question is, in material respects, no.

4.4.1 Baseline Completeness — Species Missing Without Justification

The River Little Brosna Callows SPA has eleven qualifying interest species. The CRM excludes several from individual assessment on the basis of 'fewer than ten records' during the survey period. The principal exclusions are set out in full in Appendix 4-3 (Table C1) and addressed species by species in Section 4. The key structural point here is narrower: the exclusion threshold is not applied consistently.

CRM Table 3.7 acknowledges that black-tailed godwit had fewer than ten records in the dataset. The CRM modeller included it anyway, stating that the records generated such large collision risk estimates that exclusion was not appropriate. This exception is directly documented in the CRM's own text. The threshold — fewer than ten records — is therefore not a rule. It is a filter that is applied where it produces lower estimates and set aside where a small number of records happen to generate high ones. For pintail, a nationally important flock of 200 birds was recorded and dismissed as a one-off. For black-tailed godwit, a single flock of 1,750 birds drove 95% of the CRM estimate and was retained. The asymmetry is not explained and is not consistent with any neutral scientific principle. → Appendix 4-2, Entry D4: black-tailed godwit exception to the fewer-than-ten-records rule; Section 3.5.3 below.

The underlying cause of the low record counts — dawn and dusk survey gaps established in Section 2.3, the Brosna North Corridor exclusion established in Section 2.4, and the summer 2022 absence established in Section 2.8 — is not addressed in any of the species exclusion justifications. The developer infers limited site use from low records; the correct inference is limited survey coverage of the periods when the excluded species are most active.

4.4.2 The Dominant Dataset Problem — Within-Season Variability

Section 2.1 (The Survey Dataset) established that the Ecology Ireland dataset provides 88% of the seasonal data and is methodologically deficient in multiple respects acknowledged by the CRM author. One further analytical point from the CRM itself is worth isolating here because it carries a specific implication not drawn out in Section 2.

CRM Section 4.7.2.1 analyses how uncertainty reduces as survey seasons are added. It concludes: "Uncertainty decreased substantially when the number of survey seasons increased from one to two, with smaller reductions as additional seasons were added. This suggests that the principal source of uncertainty arises from within-season sampling variability rather than the number of seasons."

This is a critical admission. 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. The Ballincor survey has nine seasons. Eight of them replicate the same within-season variability caused by mid-day concentration, non-compliant watches, and the absence of dawn and dusk coverage. Adding more Ecology Ireland seasons does not reduce this uncertainty — it replicates it. The TOBIN season reduces it for one winter. For the other eight seasons, additional survey seasons have delivered diminishing returns on a structurally deficient baseline. → Appendix 4-2, Entry C3: CRM self-identified limitation on within-season uncertainty.

4.4.3 Population Denominators — Scale and the Recovery Trajectory

Question

The CRM assesses mortality at three scales for golden plover: national, county and local SPA. At national scale, the central collision estimate generates a percentage so small it is statistically indistinguishable from zero. The developer uses this national figure to contextualise the local SPA figure as modest. The NPWS/DAU Cush letter is explicit on why this is wrong: birds at the site must be assumed to be part of the SPA population in the absence of evidence to the contrary. The SPA scale is the legally relevant denominator — not national. At SPA scale, the upper uncertainty range of the central golden plover estimate already exceeds the 1% threshold. → Appendix 4-3, SectionC4.5: Golden Plover — population denominator analysis.

The more fundamental population question is not asked at all. The NPWS/DAU requires that for a species in unfavourable conservation condition — and golden plover at the River Little Brosna Callows SPA is confirmed at 50% below its baseline reference values — the assessment must address whether the development undermines the potential for halting decline and allowing recovery to favourable conservation status. This is a different question from whether the central collision estimate at the preferred avoidance rate falls below a threshold characterised as precautionary. The first question is required by the precautionary principle and by the conservation objectives of the SPA. The second question is what the developer answered. The two are not the same.

4.4.4 Avoidance Rates — Challenged by the Regulatory Authority

The NPWS/DAU submission on the Cush Wind Farm — a development with 172m rotor diameter turbines in the same Zone of Influence — explicitly and on the record challenged the 99.6% avoidance rate applied for golden plover, on three grounds: the rate was derived from UK wind farms with maximum turbine diameters of 92m; the source data is from lowland intensive agricultural settings (tillage) very different from the midland Irish bog and pasture landscape; and NatureScot guidance acknowledges

the rates will be updated when robust new information becomes available. Ballincor's turbines have rotor diameters of 149–163m. The DAU's challenge applies unchanged. → Appendix 4-2, Entry C2; Section 4.5 (Golden Plover).

The sensitivity of the assessment to this single variable is documented in CRM Table 4.9. Moving from 99.6% to 98% — the default avoidance rate when site-specific behaviour is unknown — increases the predicted collision estimate by an order of magnitude. The CRM acknowledges (Section 5.3) that avoidance rate uncertainty is excluded from the reported uncertainty ranges entirely. The assessment therefore presents outputs whose sensitivity to the most contested input variable is acknowledged but not reflected in the figures placed before An Coimisiún Pleanála.

4.4.5 Displacement Distances and Ex-Situ SPA Connectivity

The EIAR and NIS apply displacement and disturbance distances derived from studies at turbines substantially smaller than those proposed. For curlew, the EIAR applies a 300m disturbance zone; published research documents avoidance distances of up to 800m, with breeding density reductions of up to 42% within 500m. The developer does not address this discrepancy. The Carrig DAU submission identifies the same problem for all species assessed using McGuinness 2015 guidance, noting that the turbines proposed are approximately twice the height of those in the studies on which the displacement distances are based. The DAU considers it likely that displacement distances for the larger turbines will be correspondingly greater. → Appendix 4-3, Section C4.2: Curlew; Appendix 4-3, Section C4.5: Golden Plover.

This also raises the connectivity question, whether birds recorded on the development site are part of SPA populations — is resolved by the DAU Cush letter as a matter of principle: SPA connectivity must be assumed in the absence of positive evidence to the contrary. The NIS requires positive evidence of connectivity before treating birds as SPA population members. This inverts the precautionary principle. The absence of connectivity evidence from surveys that systematically missed the periods when

commuting movements would be observed is not evidence of absence of connectivity. → Appendix 4-2, Entry D3; Section 3.6 below.

4.4.6 Five Specific Leaps in Logic

This section identifies five instances where the developer's analysis moves from data to conclusion in a way the data does not support, or where an ecologically significant finding is dismissed using reasoning inconsistent with how equivalent evidence is treated elsewhere in the same assessment.

4.4.6.1 The Pintail Flock

On 27 March 2024, a flock of approximately 200 pintail — ten times the national importance threshold of 20 birds — was recorded foraging in flooded fields adjacent to the site. Pintail is a SPA qualifying interest. A further flock of 34 birds exceeding the national importance threshold was recorded in March 2026, at the same location. The developer characterised the 2024 flock as "a one-off event" that "does not alter the overall assessment."

The CRM's own text (Section 5.2) acknowledges that VP surveys sample only 1.5–2% of daylight hours and that a large flock observed during that window may reflect genuinely infrequent occurrence or systematic under-sampling of regular events — and that "this uncertainty cannot be resolved from the available data." The CRM applies this reasoning as a caution against over-relying on the black-tailed godwit large-flock record. It does not apply it to dismiss that record. Two nationally important pintail counts in the same location in the same month of different years are not consistent with characterisation as a one-off. They point to regular use of that habitat in March — exactly what surveys concentrated in other months would miss. The appropriate response was individual CRM analysis and a specific disturbance and displacement assessment. Neither was conducted. → Appendix 4-2, Entry C8; Appendix 4-3, Section C4.8.

4.4.6.2 The 1% Threshold — Repeated Invocation

The phrase "the 1% threshold is likely to be very precautionary" appears in the CRM summary and is repeated in Chapter 7 assessments of golden plover, black-tailed godwit, grey heron, kestrel and mallard — consistently as the mechanism by which a near-threshold finding is characterised as not significant. The NPWS/DAU requires instead that for species in unfavourable conservation condition, the question is whether the development undermines recovery potential — not whether the central estimate at the preferred avoidance rate clears a threshold described as precautionary. The repeated invocation of the threshold characterisation as a blanket dismissal tool does not engage with this requirement. → Appendix 4-2, Entry E4.

4.4.6.3 Black-Tailed Godwit — Selective Application of Large-Flock Caution

The CRM (Section 5.2) acknowledges that the black-tailed godwit collision estimate was driven by a single record of 1,750 birds, accounting for 95% of the flight activity included in the model, and recommends it "should be interpreted with caution" as "a plausible worst-case scenario rather than a reliable estimate." Despite this, the estimate is carried into Chapter 7 and assessed — and then dismissed as negligible because the local SPA mortality of 2.2% annual increase is described as precautionary. The large-flock caution argument simultaneously weakens the estimate and fails to reduce it below the threshold it was supposed to breach. The pintail large-flock record generates no CRM entry at all and is dismissed as anomalous. The same type of evidence — a single large-flock observation — is precautionarily retained for one species and precautionarily dismissed for another, depending entirely on which outcome the data would otherwise produce. → Appendix 4-2, Entry D4.

4.4.6.4 Whooper Swan — Diel Gap Acknowledged, Conclusion Unchanged

CRM Section 4.7.2.5 states: "Uneven diel coverage may have caused under-estimation of Cormorant and (possibly) Whooper Swan collision risk." CRM Figure 3.6 shows higher whooper swan recording rates in the early morning in the Ecology Ireland

winter dataset, consistent with roost commuting. The CRM cannot calculate recording rates for the dawn period from the dominant dataset. An independently confirmed communal roost at Sharragh — documented by the NPWS Regional Manager, confirmed by ESB Networks' installation of bird strike deflectors on the flightline — uses a route passing through the Zone of Influence. Having acknowledged potential under-estimation, noted evidence of elevated early morning activity, and confirmed an unrecorded roost flightline, the EIAR concludes that whooper swan impact is negligible. The step from acknowledged under-estimation to negligible conclusion is not demonstrated. It is asserted. → Appendix 4-1, Table A.4: Whooper Swan; Appendix 4-2, Entry B4.

4.4.6.5 Height Overestimation Used to Downplay Results

CRM Section 4.7.2.5 states that "precautionary approaches to the assignment of flight heights may have caused general overestimation of collision risks." This statement appears in Chapter 7 as a reason to treat collision estimates that approach significance thresholds as likely over-estimates. The precautionary height assumption was adopted because the Ecology Ireland surveys did not use NatureScot-compliant height bands — making it necessary to assume all flight duration above minimum ground clearance was at collision height. The developer therefore created a survey deficiency, applied a precautionary assumption to fill it, produced higher collision estimates, and then used those estimates' precautionary character as a reason to discount them. A developer cannot use the consequences of their own survey gap to argue against the significance of the findings that gap produced. → Appendix 4-2, Entry E3.

4.4.7 The Mitigation Framework — No Operational Mitigation Exists

The most significant finding from reading Chapter 20 alongside Chapter 7 is one that the assessment does not acknowledge as a problem. Chapter 7 Section 7.7.2 states explicitly: "no dedicated mitigation measures are considered necessary for the operational phase." Chapter 20 confirms this: there is no scheduled mitigation measure reference number for bird collision mortality or displacement during turbine operation. The only operational intervention in Chapter 7 is the Bird Monitoring Programme in

Appendix 7-3, with an adaptive management trigger that activates only "if unexpected ornithological issues arise."

This matters because the no-adverse-effects conclusion in the Appropriate Assessment does not rest on mitigation that closes identified risks. It rests entirely on the adequacy of the pre-consent assessment — on the proposition that the surveys were sufficient to demonstrate that no significant effects will occur. Sections 1 and 2 of this objection have demonstrated at length that they were not. There is no backstop. The structure is circular: because the surveys concluded no significant effects, no mitigation was designed; because no mitigation was designed, any effects that do materialise can only be addressed after they have occurred.

The adaptive management trigger — "if unexpected ornithological issues arise" — does not satisfy Article 6(3). Ascertainment must be achieved before consent is granted, not monitored for after turbines are operational. For species where post-construction collision mortality would be irreversible — white-tailed eagle (150 individuals nationally), whooper swan (SPA qualifying interest on a confirmed flightline through the Zone of Influence), merlin (confirmed breeding pair within foraging range) — discovering adverse effects through post-construction monitoring is not a recoverable situation. The bird is dead. The adaptive management arrives too late.

The NPWS/DAU Cush submission addressed the post-consent mechanism directly: "The Department cannot agree or approve changes or alterations to the project, or associated conditions or mitigation measures, after approval by An Coimisiún Pleanála." Turbine curtailment or shutdown — the only operational tools available if monitoring reveals adverse effects — require DAU agreement. The DAU has stated it cannot provide that agreement after consent is granted. The monitoring programme proposed in Appendix 7-3 therefore has no lawful pathway to the adaptive management it anticipates. The mechanism to act on its findings does not exist. → DAU Cush submission, p.1; Appendix 7-3 Section 7.8.2.

4.4.8 The Legal Standard — Lacunae That Cannot Be Closed

The analytical failures identified in this section — taken individually and in combination with the survey methodology failures in Section 2 — produce the following catalogue of gaps in the Appropriate Assessment as presented:

- Baseline incomplete, with exclusions driven by survey gaps not species rarity, applied inconsistently against the developer's own CRM rules.
- Dominant dataset deficient, with within-season variability — the CRM's own primary source of uncertainty — replicated across eight seasons rather than reduced.
- Population denominators applied at scales that understate SPA-level mortality significance, without addressing the conservation trajectory question the DAU requires.
- Avoidance rates challenged by the regulatory authority as inapplicable to this turbine scale and landscape type, with sensitivity excluded from reported uncertainty ranges.
- Displacement distances based on smaller turbines in different landscapes, with connectivity assessed by inverting the precautionary principle.
- Logical inconsistencies in the treatment of large-flock events, the 1% threshold mechanism, whooper swan diel gap acknowledgements, and the height overestimation argument.
- No dedicated operational bird mitigation, leaving the assessment resting entirely on its own adequacy — which Sections 1 and 2 have demonstrated is insufficient — with a post-consent adaptive management mechanism that the DAU has stated it cannot approve.

The legal standard is established in Case C-127/02 (Waddenzee) and confirmed in the European Commission Guidance (2019, Section 4.7.3): the Appropriate Assessment must be "complete, precise and definitive" and "may not have lacunae or gaps." The assessment presented has lacunae in each of the categories above. These are not peripheral — they include the central question of whether the development undermines the recovery trajectory of a SPA population already at 50% of its baseline, operating alongside three other developments in the same Zone of Influence with no independent cumulative assessment.

The IROPI constraint is absolute: RWE has expressly waived both derogation pathways. The NIS (p.4) places no reliance on Article 6(4). The WFD Assessment (Appendix 9-1, p.28) confirms no Article 4.7 reliance. With both routes waived, if adverse effects on the integrity of any European site cannot be excluded on the basis of a complete and definitive Appropriate Assessment, An Coimisiún Pleanála has no lawful basis on which to grant consent. The gaps in Sections 2 and 3 mean that adverse effects cannot be excluded. Refusal is the only available lawful outcome.

4.5: Protected Species — Ranked Assessment

The sections that precede this one have established, in forensic detail, *what* the survey programme failed to record and *why* the model built on it cannot be relied upon. This section asks a different question: what does any of that mean for the birds themselves?

Protected species do not recognise planning application boundaries. They do not observe the distinction between the Zone of Influence as drawn on a map and the wider landscape they have used for generations. A whooper swan commuting from its roost at Sharragh before dawn, a curlew calling from its breeding territory on the bog in the first light of a June morning, a merlin hunting across the SAC at first light — none of these birds adjusted their behaviour to coincide with a six-hour mid-day survey window. They were simply not there to be counted when the counters arrived, and they were gone before the counters left. The absence of records is not evidence of absence. It is evidence of a methodology that was not designed to find them.

Dr Pat Moran completed a species review to demonstrate the methodological failures discussed previously. His stated criterion is the mismatch between a species' behavioural ecology and the survey design adopted. On that basis he prioritises species "to which survey design has not taken into account behavioural ecology," The four chosen — Golden Plover, Greenland White-fronted Goose, Lapwing and Whooper Swan — are therefore worked examples of the same underlying defect rather than a catalogue of the avifauna, and each is an Annex I species or a qualifying interest of a proximate SPA.

The four make a single argument from two directions. Golden Plover, Lapwing and Whooper Swan demonstrate the survey's timing and flight-height blindness: all are nocturnal or crepuscular movers whose daytime distribution cannot predict night-time habitat use (Gillings et al., 2005), and Whooper Swan in particular commutes at low light and at heights often below 15 metres (Brazil, 1981; Rees et al., 2005), yet no multi-

year post-sunset surveying or low-flight viewshed analysis was undertaken. Greenland White-fronted Goose and Whooper Swan demonstrate a parallel valuation failure: the goose, barely recorded on site and classed by the EIAR as of "local importance (higher value)," in fact occurred at the Little Brosna in the third-highest national count in 2024/25, while a single Swan Census peak of 176 Whooper Swan at the connected Ballingarry subsite exceeds 50% of the Collision Risk Model's own "Local" population figure.

Dr Moran is explicit that these are a representative sample rather than an exhaustive treatment. The force of the selection lies in its implication: if the survey methodology fails to characterise four flagged qualifying-interest species — failing on timing, on flight height, and on valuation — no confidence can be placed in its treatment of the wider avifaunal resource, and the deficiency carries through to the EIAR, the Collision Risk Model and the NIS alike.

This section reviews each protected species or species group first in the order presented by Dr Pat Moran and subsequently in order of conservation priority, applying the same four-part structure throughout: protection status, recorded presence in the Zone of Influence, the specific inadequacy of the developer's assessment, and the consequence under Article 6(3) if adverse effects cannot be excluded.

Where the developer's assessment focuses exclusively on collision mortality, a structural limitation of the methodology, this review will follow a three-impact framework — disturbance, displacement and collision mortality/ Each is applied to each species.

PRIORITY 1 SPECIES — HIGHEST CONSERVATION CONCERN

4.5.1 Whooper Swan (<i>Cygnus cygnus</i>)	PRIORITY 1

EU Birds Directive	Annex I — special protection measures required
Irish Wildlife Acts	Schedule 1 — fully protected
BoCCI 2020–2026	Amber List
SPA Qualifying Interest	River Little Brosna Callows SPA (004086); Middle Shannon Callows SPA (004096)
National wintering population	Approximately 19,111 individuals (Burke et al., 2021)
Developer's assessment	Local importance (higher value); impact: negligible — see Appendix 4-3 Section C4.1

Recorded presence in the Zone of Influence

Whooper swan is the most regularly recorded large waterbird in the Ballincor survey dataset. A total of 85 observations involving 744 individuals were made across the survey period, with flocks ranging from 2 to 55 birds. Records were concentrated along the Little Brosna River and adjacent flooded agricultural fields — the same corridor that connects the site to the River Little Brosna Callows SPA approximately 7km downstream. The species was recorded in all four Ecology Ireland winter seasons and in the TOBIN winter 2025/26 season.

The confirmed communal roost at NPWS-owned lands at Sharragh — documented in the Oran Ecology / Hochtors submission (2023) and confirmed by the NPWS Regional Manager — lies within the shared Zone of Influence between the Carrig and Ballincor development sites. ESB Networks previously installed bird strike deflectors on powerlines in the Sharragh and Lissernane area as a result of repeated whooper swan collisions, providing physical evidence of a long-established flightline through this landscape.

Inadequacy of the developer's assessment

- Disturbance and displacement: The NIS concludes that no adverse effects on whooper swan are anticipated because no evidence was found that birds recorded on site are part of the SPA population. This inversion of the precautionary principle is directly challenged by the DAU Cush letter, which requires that SPA connectivity be assumed in the absence of evidence to the contrary.
- Collision mortality: CRM produces a central estimate of 0.02–0.05 collisions per year (EIAR Table 7-20). The CRM itself acknowledges (Section 4.7.2.5) that 'uneven diel coverage may have caused under-estimation of Cormorant and (possibly) Whooper Swan collision risk.' This admission — that the dominant dataset may have under-estimated the figure — is not reflected in the assessment conclusion of negligible impact. → Appendix 4-2, Entry B4; Appendix 4-1, Table A.4: Whooper Swan.
- Nocturnal movement: The CRM notes higher recording rates of whooper swan in the early morning 'which could have been due to birds commuting from nocturnal roost sites.' No nocturnal surveys were conducted. The Sharragh roost — confirmed by multiple independent sources — uses a flightline toward the SPA that crosses the development Zone of Influence. Pre-dawn commuting on this line is entirely unrecorded. → Appendix 4-1, Table A.2: Winter Survey Effort.

The developer's negligible impact finding cannot be sustained where: (a) the assessment relies on absence of connectivity evidence from surveys that systematically missed the periods when connectivity evidence would be observed; (b) the CRM's own author acknowledges potential under-estimation of whooper swan collision risk; and (c) an independently confirmed roost site with documented flightline through the Zone of Influence receives no quantitative displacement or collision mortality assessment. Adverse effects on the SPA qualifying interest cannot be excluded. → Appendix 4-3, Section C4.1.

Dr Moran concluded that the site's importance for Whooper Swan is materially greater than the EIAR's characterisation of local importance (higher value) allows, and the Collision Risk Model's own population figures demonstrate why. Lough Nahinch, identified in Figure 7-6 of the Ornithology Chapter as an I-WeBS site, is a subsite of the Ballingarry (OJS03) Swan Census complex. As Dr Moran sets out (Appendix 4-6), the

2014/15 International Swan Census recorded a peak of 176 Whooper Swan at the Ballingarry subsite at Gurteen Agricultural College, and a peak of 80 at the Munlusk subsite. The Collision Risk Model assesses Whooper Swan against population figures of 337 (Local), 1,506 (County) and 19,111 (National). The Gurteen peak of 176 birds therefore represents in excess of 50% of the Local population figure and in excess of 10% of the County figure used in the developer's own model — recorded at a single subsite within the network to which the development is connected by the established flightline addressed above. A single census count on this scale, set against the model's own denominators, is incompatible with an assessment of merely local importance, and indicates a significant source–pathway–receptor link between the proposed development and the Ballingarry site that the EIAR has not assessed.

4.5.2 Golden Plover (*Pluvialis apricaria*)

PRIORITY 2

EU Birds Directive	Annex I — special protection measures required
Irish Wildlife Acts	Schedule 1 — fully protected
BoCCI 2020–2026	Red List
SPA Qualifying Interest	River Little Brosna Callows SPA (004086) — Special Conservation Interest
Local SPA population (IWeBS 5-yr mean)	Approximately 9,247 individuals (2018/19–2022/23); national 90,770
Conservation condition	Unfavourable — 50% below SPA baseline reference values (NPWS/DAU Cush letter, 2024)
Developer's assessment	Individual CRM assessment conducted; impact assessed as negligible — Appendix 4-3 Section C4.5

Golden plover is the primary SPA qualifying interest species for which a quantified collision risk has been modelled at Ballincor. It is also the species for which the regulatory context is most clearly defined by the NPWS/DAU Cush submission (March 2024). The key analytical failings are set out in full in Sections 3.4 and 3.7 of this objection and in Appendix 4-2, Entries C2, E2 and E4. The following summarises the position.

- Recorded presence: 85 observations involving 6,607 individual birds across the survey period. Peak count approximately 3,500 birds within 500m of the site boundary (NIS, p.11). Regularly recorded in all nine seasons. The CRM uses the Little Brosna Callows IWeBS five-year mean peak of 9,247 birds as the local SPA population denominator. → Appendix 4-4, Sheet 1: VP Effort (EI dataset — golden plover dominant in mid-day records).
- Collision mortality: Central estimate 7.9–9.4 collisions per year (N163, 99.6% avoidance). Upper uncertainty range 1.0–1.3% annual mortality at local SPA population scale — exceeding the 1% threshold. The developer dismisses this on the basis that the 1% threshold is 'highly precautionary.' The DAU requires instead that the assessment ask whether the development undermines the potential for recovery of a population already 50% below baseline. That question has not been answered. → Appendix 4-2, Entries C2, E4.
- Avoidance rate: 99.6% applied. The DAU Cush letter explicitly challenges this as inapplicable to 149–163m rotor diameter turbines in bog/pasture landscape — derived from farms with maximum 92m rotor diameter in UK tillage. At 98% avoidance, the predicted collision rate increases by an order of magnitude. → Section 3.4 of this objection.
- Disturbance and displacement: The EIAR applies a 175–200m disturbance zone based on Hötter et al. (2006) and Pearce-Higgins et al. (2009). These studies were conducted at turbines substantially smaller than those proposed. No assessment of disturbance impact on a population already in unfavourable conservation condition.

Golden plover is a SPA qualifying interest in unfavourable conservation condition. *The* regulatory authority has explicitly stated that the assessment must address recovery potential — not merely whether the central collision estimate exceeds a threshold characterised as precautionary. The Ballincor assessment does not meet this standard. Combined with the additive collision mortality from Cush, Derrinlough and Carrig — none of which is assessed in combination — the aggregate burden on the SPA population has never been calculated by any developer or regulatory body. → Appendix 4-3, Section C4.5; Appendix 4-5, Table E2: Combined collision mortality.

The inadequacy of daytime survey effort for Golden Plover — and equally for Lapwing — is not merely a matter of hours missed; it is that daytime data cannot scientifically be used as a proxy for night-time use. Dr Moran (Appendix 4-6) draws on the peer-reviewed work of Gillings, Fuller and Sutherland (2005, *The Auk* 122(4):1249–1260), which establishes that diurnal studies do not predict nocturnal habitat choice and site

selection in European Golden Plover and Northern Lapwing. Both species typically forage across farmland at night, and the NatureScot guidance correspondingly requires that for species which are active at dawn and dusk, or at night, other methods of recording or assessing activity — including night-vision or infra-red equipment and survey on moonlit nights — need to be employed. No such methods were deployed. The day-time distribution recorded for Golden Plover and Lapwing therefore cannot be relied upon to characterise their post-sunset use of the site and environs — a failure of particular consequence given that both are qualifying interests of proximate SPAs, recorded at this site in nationally significant numbers against a background of steep national decline.

4.5.3 Greenland White-fronted Goose (*Anser albifrons flavirostris*)

PRIORITY 2

EU Birds Directive	Annex I — special protection measures required
Irish Wildlife Acts	Schedule 1 — fully protected
BoCCI 2020–2026	Amber List
SPA Qualifying Interest	River Little Brosna Callows SPA; All Saints Bog SPA; Dovegrove Callows SPA
World population	Approximately 22,000–27,000 — entire world population winters in Ireland and Scotland
Developer's assessment	Grouped in 'rarely recorded target species' — Appendix 4-3 Section C4.6

Greenland white-fronted goose was recorded in winter 2022/23 (two records, single bird each) and in the TOBIN winter 2025/26 season. The species is listed as a rarely recorded target species. The entire world population of this subspecies winters in Ireland and Scotland, Ireland therefore holds unique and absolute conservation responsibility. The species is among the most disturbance-sensitive in the Irish wintering assemblage, flushing at several hundred metres from human activity, with repeated disturbance preventing access to feeding grounds and affecting body condition and survival.

A tagged Greenland white-fronted goose was recorded by a University of Saskatchewan PhD researcher passing within 6km of the Cush Wind Farm site during migration from the Wexford Slobs — directly cited in the NPWS/DAU Cush letter as evidence of migratory connectivity through the Zone of Influence. The Ballincor site lies within the same Zone of Influence. The NIS does not address this evidence. Pre-dawn and post-dusk roost commuting — the primary movement period for this species — is absent from the Ecology Ireland dataset across all four winter seasons. → Appendix 4-1, Table A.4: Greenland White-fronted Goose; Appendix 4-3, Section C4.6.

A species whose entire world population winters in Ireland and Scotland cannot be assessed collectively with common and widespread species. The tagged bird evidence demonstrates migration connectivity through the Zone of Influence. The absence of pre-dawn and post-dusk survey coverage means the primary risk period for this species is uncharacterised. For a subspecies of this global significance, the precautionary principle demands individual treatment and explicit exclusion — beyond reasonable scientific doubt — of adverse effects. That standard has not been met.

The EIAR's classification of Greenland White-fronted Goose as being of local importance (higher value) further understates the status of the population connected to this site. Dr Moran (Appendix 4-6) records that, during the 2024/25 season, the River Little Brosna Callows held the third-highest population of Greenland White-fronted Geese in Ireland, as reported in the 2024/25 international census of the species. As the Little Brosna Callows lies within the Zone of Influence and supports an internationally important population of this Annex I qualifying interest — for which the SPA conservation objective is to restore, not merely maintain, favourable condition — the species must be assessed as of international importance, and the low number of on-site records cannot be taken to reflect a correspondingly low ecological significance.

4.5.4 Hen Harrier (*Circus cyaneus*)

PRIORITY 2

EU Birds Directive	Annex I — special protection measures required
Irish Wildlife Acts	Schedule 1 — fully protected
BoCCI 2020–2026	Amber List
SPA Qualifying Interest	Slieve Bloom Mountains SPA — within potential range
Irish breeding population	Approximately 108–130 pairs nationally
Developer's assessment	Individual assessment conducted; TOBIN roost surveys Winter 2025/26 — Appendix 4-3 SectionC4.7

Hen harrier was recorded in breeding season 2023 and in all four Ecology Ireland winter seasons and the TOBIN winter. TOBIN conducted roost surveys at two designated harrier VP locations (HHVP1 and HHVP2) during winter 2025/26. Woodcock records from the HHVP2 roost survey (9 March 2026, 19:18, 4 birds roding — Appendix 7-1-C, P00765) confirm that the roost area is ecologically active at dusk. Hen harrier roost departure typically occurs in pre-dawn darkness; the TOBIN roost surveys covered this period for one winter.

The roost survey programme is an improvement on the Ecology Ireland methodology but represents one winter season. The breeding season record in 2023 — which occurred in the transition period between breeding and wintering — has not been followed with a targeted breeding disturbance assessment. Research documents avoidance of wind turbines by breeding hen harriers at distances of up to 750m. → Appendix 4-3, SectionC4.7.

One season of roost surveys cannot be considered an adequate basis for concluding that roost site and movement patterns are sufficiently characterised for an Annex I species. The confirmed breeding season record and the adjacent bog SAC network — confirmed as active raptor breeding habitat in 2025 — indicate a broader raptor assemblage that the survey programme has not fully characterised.

The Appropriate Assessment screening also discounted a connected European site for this species on a demonstrably flawed basis. The screening process found no source–pathway–receptor linkage between the proposed development and the Slieve Bloom

Mountains SPA (004160) on the ground that the site lies approximately 10 km away and therefore outside the foraging range of the relevant species. As Dr Moran sets out (Appendix 4-6), that reasoning applies a summer breeding-season foraging range to screen out a species whose wintering distribution is materially more dispersed: the Hen Harrier Threat Response Plan records that wintering Hen Harrier range widely across both uplands and lowlands, roosting communally in heath and bog habitats and foraging over prey-rich grassland and winter stubble — precisely the habitat mosaic present in the vicinity of this site. The National Biodiversity Data Centre records confirm Hen Harrier in the vicinity, and the site's own winter survey results recorded the species using the site and environs across all five winter seasons. To discount the linkage to the Slieve Bloom Mountains SPA on the basis of a summer foraging limit, when the relevant exposure is during winter and when Hen Harrier is in fact recorded locally throughout the winter, is a significant omission in the screening exercise.

4.5.5 Eurasian Curlew (<i>Numenius arquata</i>)	PRIORITY 1

EU Birds Directive	Annex I — special protection measures required
Irish Wildlife Acts	Schedule 1 — fully protected
BoCCI 2020–2026	Red List — critical decline
SPA Qualifying Interest	Not a direct qualifying interest of local SPAs; present in callows assemblage
Irish breeding population	Approximately 105–130 breeding pairs nationally (NPWS)
Developer's assessment	Grouped in 'rarely recorded target species' collective — see Appendix 4-3 Section C4.2

Recorded presence in the Zone of Influence

Curlew was recorded during breeding season 2023 (Appendix 7-1-C: WD1-23, VP A/3/4, 27 June 2023, one bird at 80m, 200 seconds on-site) and in winter 2020/21 (one record). A total of two records across nine seasons. Both are daytime, mid-period observations: the summer record was made at 11:15 — outside any dawn or dusk window. The species is Red-listed and is known to be predominantly active at dawn

and dusk. The low record count is a direct consequence of the survey methodology, not evidence of limited site use.

The 2021 NPWS national breeding curlew survey recorded a probable breeding curlew in the Arragh More Bog NHA / Kilcarren-Firville Bog SAC area, southwest of Sharragh — within the shared Zone of Influence of the Ballincor and Carrig developments. In May and June 2025, BirdWatch Ireland confirmed curlew presence during the breeding season on Ballyduff/Clonfinnane Bog SAC, approximately 2.8km northwest of the Ballincor site, using passive acoustic monitoring. → Section 2.9 of this chapter.

Inadequacy of the developer's assessment

- Collective assessment: Curlew is assessed collectively in the 'rarely recorded target species' group alongside common gull, coot, herring gull and tufted duck. A species with 105 breeding pairs nationally cannot be assessed at the same level of analysis as abundant common species. The DAU Carrig submission states explicitly: 'the loss of one pair would equate to almost 1% of the national breeding population.' → Appendix 4-3, Section C4.2.
- No individual breeding survey: The NPWS scoping response required targeted surveys for sensitive species. No targeted curlew breeding survey using appropriate methodology (territory mapping, dawn calling surveys) was conducted. The BirdWatch Ireland 2025 Autonomous Recording Unit survey on the adjacent SAC demonstrates what such a survey would have found. → Appendix 4-2, Entry B3: summer 2022 absent; Section 2.9.
- Displacement distances: The EIAR applies a 300m disturbance zone for curlew from operational turbines. Published research documents avoidance distances of up to 800m, with breeding density reductions of up to 42% within 500m. The developer does not address this discrepancy.
- Dawn coverage: The breeding season record (June 2023) was made at 11:15. Zero dawn coverage in summer means that territorial behaviour and early-morning movements — the primary evidence of breeding activity — were never recorded. → Appendix 4-1, Table A.1: Summer Survey Effort (row: Sunrise and Sunrise+1: 0 minutes).

The collective assessment of curlew is legally indefensible given its national population size and the DAU's explicit statement on individual-level significance. The

inference that low recording rates indicate limited site use is directly contradicted by the dawn survey gap and by the 2025 BirdWatch Ireland findings on the adjacent SAC. No breeding disturbance assessment has been provided for a Red-listed species with confirmed presence in the Zone of Influence and known sensitivity to turbine disturbance during breeding. Adverse effects on this nationally critical species cannot be excluded. → Appendix 4-3, SectionC4.2.

4.5.6 Merlin (*Falco columbarius*)

PRIORITY 1

EU Birds Directive	Annex I — special protection measures required
Irish Wildlife Acts	Schedule 1 — fully protected
BoCCI 2020–2026	Amber List
SPA Qualifying Interest	Not a direct qualifying interest of local SPAs
Irish breeding population	Approximately 130–170 pairs nationally; concentrated on bog habitats
Developer's assessment	Grouped in 'rarely recorded target species' — see Appendix 4-3 SectionC4.3



Image : Merlin within Development site

Recorded presence in the Zone of Influence

Merlin was recorded in breeding seasons 2023 and 2024 and in all four Ecology Ireland winter seasons and the TOBIN winter 2025/26. The EIAR records the species as a 'rarely recorded target species' with fewer than ten observations. The most recent and

significant evidence, however, is external to the developer's programme: BirdWatch Ireland confirmed breeding merlin on Ballyduff/Clonfinnane Bog SAC in May and June 2025, using six ARUs deployed around the SAC perimeter. The nest was subsequently located. This SAC lies approximately 2.8km northwest of the proposed Ballincor development site.

A breeding merlin pair on the SAC will forage across a range of 2–3km from the nest during the breeding season. The nearest proposed turbine locations are approximately 1–2km from the SAC boundary, placing them within the foraging range of the confirmed breeding pair. Merlin hunt actively at dawn — the period entirely absent from the Ecology Ireland summer dataset. The four breeding season surveys conducted without dawn coverage could not have detected the dawn hunting behaviour that would be the primary evidence of breeding-season site use. → Appendix 4-1, Table A.1: Sunrise row — 0 minutes across all four summer seasons.

Inadequacy of the developer's assessment

- Collective assessment: Merlin is grouped in the rarely recorded collective and receives no individual collision risk assessment and no breeding disturbance assessment. An Annex I species with a confirmed breeding pair within the foraging range of the development cannot be collectively assessed. → Appendix 4-3, Section C4.3.
- Methodology gap: The survey programme did not deploy acoustic monitoring — the technology that detected the breeding pair in 2025. The 2025 BirdWatch Ireland survey demonstrates that appropriate methodology at the appropriate season would have identified breeding merlin as a material consideration before the application was submitted.
- Post-submission evidence: The 2025 breeding confirmation postdates the EIAR. It is new material evidence before An Coimisiún Pleanála that the developer's Appropriate Assessment did not and could not address. It changes the assessment context fundamentally.
- No breeding disturbance assessment: Merlin is sensitive to nest disturbance during incubation and early chick-rearing. Construction activity within the foraging range of a breeding pair — during the breeding season that overlaps the proposed construction programme — has not been assessed.

The confirmed breeding of merlin on the adjacent SAC in 2025 is material evidence that was not addressed in the developer's assessment and cannot be remedied by post-consent monitoring. A breeding pair of an Annex I species with a foraging range overlapping the turbine zone engages the Article 6(3) disturbance and displacement pathway directly. No assessment of breeding season disturbance, displacement from foraging habitat, or collision mortality risk to breeding adults has been provided. Adverse effects cannot be excluded. → Appendix 4-3, SectionC4.3.

4.5.7 White-tailed Eagle (*Haliaeetus albicilla*)**PRIORITY 1**

EU Birds Directive	Annex I — special protection measures required
Irish Wildlife Acts	Schedule 1 — fully protected
BoCCI 2020–2026	Red List
SPA Qualifying Interest	Not a direct qualifying interest of local SPAs
Irish wild population	Approximately 150 individuals — entire Irish wild population (NPWS, 2025)
Developer's assessment	County importance (higher value); grouped in 'rarely recorded target species'

Midland Tribune

White-tailed eagles spotted in the Little Brosna CallowsBy Derek Fanning
Midland Tribune Deputy Editor

Published 27th Feb 2016, 18:00 BST



The pair of White-tailed eagles in the Little Brosna Callows last week.

Magnificent birds of prey have wing span of 8 feet

A PAIR of white-tailed eagles were spotted by birdwatchers in the Little Brosna Callows near Birr and Banagher last week.

Why 150 individuals changes every calculation

This is not a species where statistical thresholds designed for abundant or common populations can be applied without qualification. The entire wild population of white-

tailed eagle in Ireland is approximately 150 individuals (NPWS, 2025 — cited in EIAR Section 7.4.2.1.35). The species was extinct in Ireland for over a century before reintroduction from Norway. The NPWS White-tailed Eagle Reintroduction Programme has been described by the NPWS as among the most significant nature conservation undertakings in the state's history.

With 150 individuals, one dead white-tailed eagle represents 0.67% of the national population. The CRM produces a central estimate of 0.02–0.04 collisions per year. Over a 30-year operational lifetime, this equates to an expected 0.6–1.2 birds. The developer assesses this as below the 1% annual mortality threshold for the national population — approximately 1.5 birds per year — and therefore negligible. But the 1% threshold was designed for populations where individual losses are statistically insignificant and where compensatory mortality mechanisms operate. Neither condition applies to a population of 150 individuals undergoing fragile recovery from functional extinction. A single collision fatality over the 30-year operational life of the Ballincor wind farm is individually irreplaceable. This is not a statistical argument — it is a biological one. → Appendix 4-3, Section C4.4: White-tailed Eagle special note.

Recorded presence in the Zone of Influence

White-tailed eagle was recorded twice during the TOBIN winter 2025/26 season — the first and only season in which this species was specifically looked for at dawn and dusk. A single bird was recorded in flight in the southern section of the proposed project site in December 2025 (TOBIN VP5, 19 November 2025, Appendix 7-1-C, F00068). Two birds were observed within the 10km buffer at the River Little Brosna Callows SPA during IWeBS surveys in November 2025. The EIAR states the site 'may provide suitable foraging habitat for the White-tailed Eagle, especially during the winter months.' The species is found only in the TOBIN season — one winter.

This recording pattern is directly attributable to methodology. White-tailed eagles are active early in the morning and in the late afternoon. The Ecology Ireland surveys — eight seasons, covering four breeding and four winter periods — have zero dawn coverage in summer and 16 total minutes at sunset across four winters. It is not possible to conclude from the absence of white-tailed eagle records in those eight

seasons that the species does not use the site. → Appendix 4-4, Sheet 2: Methodology Comparison.

Inadequacy of the developer's assessment

- Collective assessment: White-tailed eagle is grouped in the 'rarely recorded target species' collective alongside common gull, coot, kingfisher, jack snipe and green sandpiper. A species with 150 individuals nationally — Annex I, Red-listed — cannot be assessed at the same level of analysis as common and widespread species. The juxtaposition is indefensible.
- The 1% threshold: The CRM central estimate of 0.02–0.04 collisions per year is assessed against the 1% annual threshold for the national population ($150 \times 1\% = 1.5$ birds/year). The central estimate falls below this. But the threshold was not designed for populations this small. The CRM itself acknowledges (Section 2.7, Table 2.7) that the 1% threshold 'may be biologically implausible' for 'small populations with low mortality rates.' White-tailed eagle is exactly this case. → Appendix 4-2, Entry C2: avoidance rate and 1% threshold limitations.
- No displacement or disturbance assessment: White-tailed eagles are sensitive to human disturbance and may avoid wind farms. No assessment of displacement from foraging habitat or disturbance during the breeding season has been provided for a confirmed on-site species.
- One-season detection: Two records from one winter season cannot support any conclusion about the frequency or pattern of white-tailed eagle use of the development zone. Eight prior seasons provided no dawn or dusk coverage — the periods most relevant to this species' daily movements.

With approximately 150 individuals in the wild, white-tailed eagle is a species where no individual can be treated as statistically insignificant. The 1% annual mortality threshold — acknowledged by the CRM itself as potentially biologically implausible for small populations with low mortality rates — is not an appropriate assessment tool for a population of this size. The collective assessment alongside common species is not justified by any ecological or legal standard. On-site records during the one methodologically adequate season confirm the species uses the Zone of Influence. Adverse effects cannot be excluded on the evidence presented. → Appendix 4-3, Section C4.4.

PRIORITY 2 SPECIES — SIGNIFICANT CONSERVATION CONCERN

4.5.8 Pintail (<i>Anas acuta</i>)	PRIORITY 2

EU Birds Directive	Annex II/1, III/1 — but SPA qualifying interest
Irish Wildlife Acts	Schedule 1 — protected
BoCCI 2020–2026	Amber List
SPA Qualifying Interest	River Little Brosna Callows SPA (004086) — Special Conservation Interest
National importance threshold	20 birds (1% of estimated Irish wintering population of approximately 2,000)
Developer's assessment	Grouped in 'rarely recorded target species'; nationally important flock dismissed — Appendix 4-3 SectionC4.8

Pintail is treated in detail in Section 3.7.1 of this objection as the most acute single instance of a logical leap in the developer's analysis. The key facts are as follows. Pintail was recorded on six occasions within the proposed development site across the survey period. In March 2024, a flock of approximately 200 birds was recorded foraging in flooded fields to the northeast of the site — ten times the national importance threshold of 20 birds. In March 2026, a further flock of 34 birds was recorded at the same location — also above the national importance threshold. Both records are during the same month of different years in the same habitat. The developer describes the March 2024 flock as 'a one-off event' and concludes it does not alter the overall assessment. → Section 3.7.1; Appendix 4-3, SectionC4.8.

The pintail is a SPA qualifying interest of the River Little Brosna Callows SPA. The SPA conservation objective requires maintenance of the population in favourable condition. The SPA site synopsis records a baseline mean peak of 130 pintail. A flock of 200 birds using the development zone represents the SPA population's ex-situ feeding habitat — precisely the type of usage that the conservation objectives require to be protected. The application of the 'one-off' characterisation to dismiss a nationally important flock of a SPA qualifying interest species is not consistent with the precautionary principle or with the standard required by Article 6(3). → Appendix 4-2, Entries D3 and C8.

PRIORITY 3 SPECIES AND OTHER SPECIES OF CONCERN

4.5.9 SPA Qualifying Interest Waterbirds (Lapwing, Wigeon, Teal, Shoveler, Black-tailed Godwit)	PRIORITY 3

Lapwing	BoCCI Red List; SPA qualifying interest — Little Brosna Callows SPA and Middle Shannon Callows SPA
Wigeon	BoCCI Amber List; SPA qualifying interest — River Little Brosna Callows SPA
Teal	BoCCI Amber List; SPA qualifying interest — River Little Brosna Callows SPA
Shoveler	BoCCI Red List; SPA qualifying interest — River Little Brosna Callows SPA
Black-tailed Godwit	BoCCI Red List; SPA qualifying interest — River Little Brosna Callows SPA and Middle Shannon Callows SPA
Developer's assessment	Individual CRM assessments for lapwing, wigeon and godwit; shoveler and teal excluded — Appendix 4-3 SectionC4.9

All five species are SPA qualifying interests of the River Little Brosna Callows SPA. The BirdWatch Ireland IWeBS data submitted in these proceedings shows that the SPA supports mean peak counts of: lapwing 4,787 / wigeon 4,935 / teal 2,683 / shoveler 358 (with single survey peaks approaching or exceeding 1% international thresholds) / black-tailed godwit 3,553. The following notes apply to each:

- Lapwing (Red List): Recorded in breeding season 2023, suggesting possible breeding activity. This has not been followed with a specific breeding disturbance assessment. CRM central estimate 1.4–1.6 collisions per year (local population 0.1% annual mortality increase). The upper uncertainty range is 0.3% — below the 1% threshold, but additive with other developments on the same SPA population. → Appendix 4-3, SectionC4.9; Appendix 4-5, SectionE4.
- Wigeon (Amber List): Nocturnal feeder. The CRM applies a nocturnal activity correction (ranking 2, 25% nocturnal rate) using literature values — no site-specific nocturnal data exists. Central estimate 1.4–2.4 collisions per year (local SPA population 0.0% — IWeBS denominator for wigeon at the SPA is 6,452). The wigeon population at the SPA is in

unfavourable condition (conservation objective: to restore favourable condition). → Appendix 4-2, Entry E1: nocturnal ranking limitations.

- Teal (Amber List): Excluded from CRM on fewer-than-10-records basis. Teal is recorded in winters 2021/22, 2023/24 and 2025/26. Nocturnal feeder — the mid-day survey concentration would systematically under-record this species. The SPA conservation objective is to maintain favourable condition. No individual disturbance, displacement or collision assessment. → Appendix 4-2, Entry D3: <10 records exclusion.
- Shoveler (Red List): Excluded from CRM. Recorded in winters 2023/24 and 2025/26. Red-listed. The IWeBS SPA data records single-survey peaks of 592 birds approaching the 1% international threshold of 600. No individual assessment. → Appendix 4-2, Entry D3; Appendix 4-3, Section C4.9.
- Black-tailed godwit (Red List): The highest per-species collision risk in the CRM. Central estimate 3.3–4.7 collisions per year (local SPA population 1.6–2.2% annual mortality increase — exceeding the 1% threshold). The developer dismisses this because the estimate is 'driven by a single large flock event.' The CRM itself acknowledges this uncertainty cannot be resolved from available data — meaning additional survey effort was required, not dismissal of the finding. → Section 3.7.3; Appendix 4-2, Entry D4.

The aggregate collision mortality across these five SPA qualifying interest species — when added to the estimates for golden plover, whooper swan and Greenland white-fronted goose — represents a significant combined burden on the SPA populations. No developer has presented a combined species-level assessment. → Appendix 4-5, Section E4 and Table E2.

4.5.10 Other Species of Concern (Barn Owl, Kingfisher, Woodcock, Snipe, Peregrine)

PRIORITY 3

Barn Owl	BoCCI Red List; confirmed breeding nest approximately 75m from site (NPWS, July 2023)
Kingfisher	Annex I; BoCCI Amber List; recorded in winters 2020/21 and 2025/26
Woodcock	BoCCI Red List; records of drumming males — probable breeding; recorded in TOBIN season
Snipe	BoCCI Red List; excluded from CRM (VP surveys ineffective); recorded across multiple seasons
Peregrine	Annex I; BoCCI Green List; recorded in multiple breeding and winter seasons
Developer's assessment	All grouped in 'rarely recorded target species' collective — Appendix 4-3 SectionC4.10

Five species of significant individual protection status — two Annex I, three Red-listed — are assessed collectively in the rarely recorded group. Individual notes:

- Barn owl: See separate dedicated Barn Owl Chapter Chapter 4B but for consistency we offer a summary here: NPWS personnel confirmed a breeding nest site approximately 75 metres from the wind farm site boundary in July 2023 (cited in Carrig Ch.7 notes; EIAR acknowledges a confirmed breeding territory 75m from the site on p.7-45). This is an extraordinary proximity for a Red-listed species. The EIAR states no barn owl flight activity was recorded during VP surveys and concludes collision risk is negligible — acknowledging that the species is 'largely nocturnal and therefore standard VP surveys are likely to have missed this species.' With a confirmed active breeding site at 75m, and the developer's own acknowledgement that surveys could not detect this species, a species-specific nocturnal survey was required. It was not conducted. → Appendix 4-3, SectionC4.10.
- Kingfisher: Annex I species. Recorded in winter 2020/21 and winter 2025/26. The River Brosna corridor through the site is classic kingfisher habitat. Grouped in collectively assessed rarely recorded group with no Annex I-specific treatment. → Appendix 4-3, SectionC4.10.

- Woodcock: Red-listed. Records of drumming males indicate probable breeding. Woodcock is a crepuscular and nocturnal species — entirely missed by mid-day survey methodology. TOBIN winter records (Appendix 7-1-C, P00763: roding males observed at HHVP2 roost, 9 March 2026, 19:18) confirm crepuscular activity at the site during the one methodologically adequate season. → Appendix 4-1, Table A.4: species significance at dawn and dusk.
- Snipe: Red-listed. Excluded from the CRM because 'vantage point surveys are not an effective method of sampling their flight activity.' This is the developer's own statement — a methodological limitation acknowledged for one species. The absence of alternative assessment (acoustic monitoring, targeted snipe surveys) is a gap not addressed. → Appendix 4-2, Entry D1: snipe exclusion.
- Peregrine: Annex I. Recorded in multiple breeding and winter seasons, including two breeding season observations involving an adult and juvenile pair — consistent with breeding nearby. No individual collision risk assessment despite confirmed multi-season presence. → Appendix 4-3, SectionC4.10.

The assessment of five species of significant individual protection status as a 'collective' is not justified by any ecological or legal standard. The barn owl situation is the most acute: a confirmed active breeding nest at 75m from the site boundary, the developer's own acknowledgement that surveys could not detect the species, and the absence of any nocturnal survey to address this. The NPWS scoping response specifically identified barn owls as requiring 'detailed and specific surveys.' That requirement has not been met. → Appendix 4-3, SectionC4.10.

4.5.11 Habitat Connectivity and the SAC Network (Raised bog corridor function)

PRIORITY 3

Sharavogue Bog SAC	000585 — immediately adjacent; Active Raised Bog [7110*] priority habitat
Ballyduff/Clonfinnane Bog SAC	000641 — approximately 2.8km northwest; confirmed 2025 breeding merlin and curlew
Arragh More (Derrybreen) Bog SAC	002207 — approximately 5.2km west; within shared Zone of Influence

Kilcarren-Firville Bog SAC	000647 — within shared Zone of Influence; high quality active raised bog
Redwood Bog SAC	002353 — within Zone of Influence
Article 10 obligation	Habitats Directive Article 10: member states required to manage landscape features important for Natura 2000 coherence

The midland bog network as an ecological corridor

The raised bog SACs in the midlands form a network of high-quality habitats that function as an ecological corridor for species that breed on or move between bog habitats. Merlin, curlew and hen harrier use multiple sites within this network during breeding and non-breeding seasons. The network includes Sharavogue Bog SAC (immediately adjacent to the Ballincor site), Ballyduff/Clonfinnane Bog SAC (2.8km northwest — confirmed 2025 breeding Annex I species), Arragh More Bog SAC (5.2km west, within the Carrig Zone of Influence), Kilcarren-Firville Bog SAC, and Redwood Bog SAC. Together these sites form a corridor approximately 15km in extent across the Offaly/Tipperary border region.

The barrier effect of wind turbines on the corridor

The proposed Ballincor turbines — 11 structures up to 200m tip height — would be sited at the northern end of this corridor, between Sharavogue Bog SAC and the bog SACs to the south and west. The Carrig Wind Farm (7 turbines, granted June 2025), approximately 4km to the southeast, would close the southern end of the same corridor. Together, the two developments create a turbine presence across the principal movement routes connecting the bog SAC network.

For species such as merlin and curlew — which move between the bog habitats for breeding and foraging — the barrier effect is not theoretical. The 2025 BirdWatch Ireland survey confirms active breeding on Ballyduff/Clonfinnane SAC. The foraging range of that breeding pair overlaps the proposed turbine zone. For a breeding merlin pair, repeated passage through a turbine zone during the breeding season represents both a disturbance risk (if the pair alters its foraging behaviour to avoid the zone) and a displacement risk (if the zone becomes effectively inaccessible as foraging habitat). Both outcomes would reduce breeding success.

Article 10 — the missing assessment

Article 10 of the Habitats Directive requires member states to manage landscape features of major importance for the coherence of the Natura 2000 network — including ecological corridors, stepping stones, and other features that promote dispersal and genetic exchange. The bog SAC network in the midlands is precisely such a feature: a network of designated sites connected by movement of mobile species that depend on the availability of multiple bog habitats across the region.

Neither the EIAR nor the NIS addresses Article 10 corridor function as a distinct assessment requirement. The NIS assesses each European site individually in terms of its qualifying interests, but does not address the network-level function of the corridor as a whole. The cumulative barrier effect of Ballincor and Carrig across the corridor has not been assessed in any document submitted with either application. → Appendix 4-5, SectionE5: Additive displacement and barrier effect; Appendix 4-3, SectionC4.11.

The midland bog SAC network provides ecological corridor function that is legally relevant to the integrity of each designated site within it. A development that places 11 turbines up to 200m at the northern terminus of this corridor — combined with the recently consented Carrig development to the southeast — creates a cumulative barrier effect that has never been assessed by any developer but is a required commitment from this Developer given that this is the latest in a string of applications.

The 2025 BirdWatch Ireland breeding survey confirms that this corridor is actively used by breeding Annex I species. Disturbance to breeding populations that depend on corridor connectivity, and displacement from the foraging areas that sustain them, are impact pathways that engage Article 6(3) directly and have not been adequately addressed in the Appropriate Assessment submitted with this application.

4.6 : Cumulative Impact — The Absent Assessment

4.6.1 The Legal Requirement — Article 6(3) and In-Combination Assessment

This section demonstrates that no developer in the Zone of Influence has conducted a true in-combination assessment. Detailed development data is available in Appendix 4-5: Cumulative Developments Register. CRM references to Appendix 7-2 of the EIAR.

The in-combination assessment obligation is not a secondary or supplementary requirement of the Habitats Directive. It is written into the text of Article 6(3) itself. The provision states that any plan or project 'likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subjected to appropriate assessment of its implications for the site in view of the site's conservation objectives.' The words 'or in combination' are not qualified. They apply to every Appropriate Assessment. They applied to Derrinlough when it was consented in 2021, to Cush in 2024, to Carrig in 2025, and they apply to Ballincor now.

The obligation is transposed into Irish law by Section 177U(4) of the Planning and Development Act 2000 (as amended), which requires that an AA is required if it cannot be excluded 'on the basis of objective information, that the proposed development, individually or in combination with other plans or projects, will have a significant adverse effect on a European Site.' The Ballincor NIS acknowledges this obligation in its methodology section (Section 1.3.1) and in its screening conclusion (Section 5.5), which correctly identifies likely significant effects in combination for the River Little Brosna Callows SPA and five other European sites. The NIS then proceeds to Stage 2 Appropriate Assessment, where the in-combination assessment is provided in Section 6.3. It is the adequacy of that Stage 2 in-combination assessment that this section challenges.

Two further omissions in the Appropriate Assessment process are identified on independent peer review. First, the screening exercise does not appear to have consulted the Natura 2000 standard data forms for the relevant sites in order to

identify the existing pressures, threats and activities affecting them, notwithstanding that European Commission guidance identifies the information in those forms as the starting point for identifying the features that could be affected by a plan or project. As Dr Moran sets out (Appendix 4-6), the failure to consult these forms and to consider the threats, pressures and activities they record is a deficiency in the screening process. Second, the assessment gives no consideration to the potential effect of climate change on the conservation objectives of the relevant sites — including climate-driven changes in water levels, habitat availability, and the distribution and flight paths of the wintering bird populations for which the SPAs are designated — despite EU guidance that potential modifications to Natura 2000 sites linked to climate change should be assessed on a case-by-case basis. For a development advanced as a climate measure, the absence of any assessment of climate-driven change to the very sites it may affect is a notable gap in the assessment.

4.6.1.1 Relevant CJEU jurisprudence

The Court of Justice of the European Union has addressed the standard for in-combination assessment in several cases relevant to this objection.

- Case C-127/02 (Waddenzee, 2004): The Court established that an Appropriate Assessment must be 'complete, precise and definitive' and cannot authorise a plan or project where there is any reasonable scientific doubt about adverse effects on site integrity. This standard applies to the in-combination assessment as much as to the individual project assessment.
- Case C-258/11 (Sweetman v An Bord Pleanála, 2013): The Court confirmed that the in-combination assessment must be carried out before consent is granted. A competent authority 'can agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned.' This means the assessment must be complete at the decision stage — not adaptive thereafter.
- Case C-323/17 (People over Wind, 2018): The Court established that mitigation measures cannot be taken into account at the screening stage for AA — they must be assessed at the full AA stage, meaning that mitigation reliance cannot substitute for a complete assessment of adverse effects.

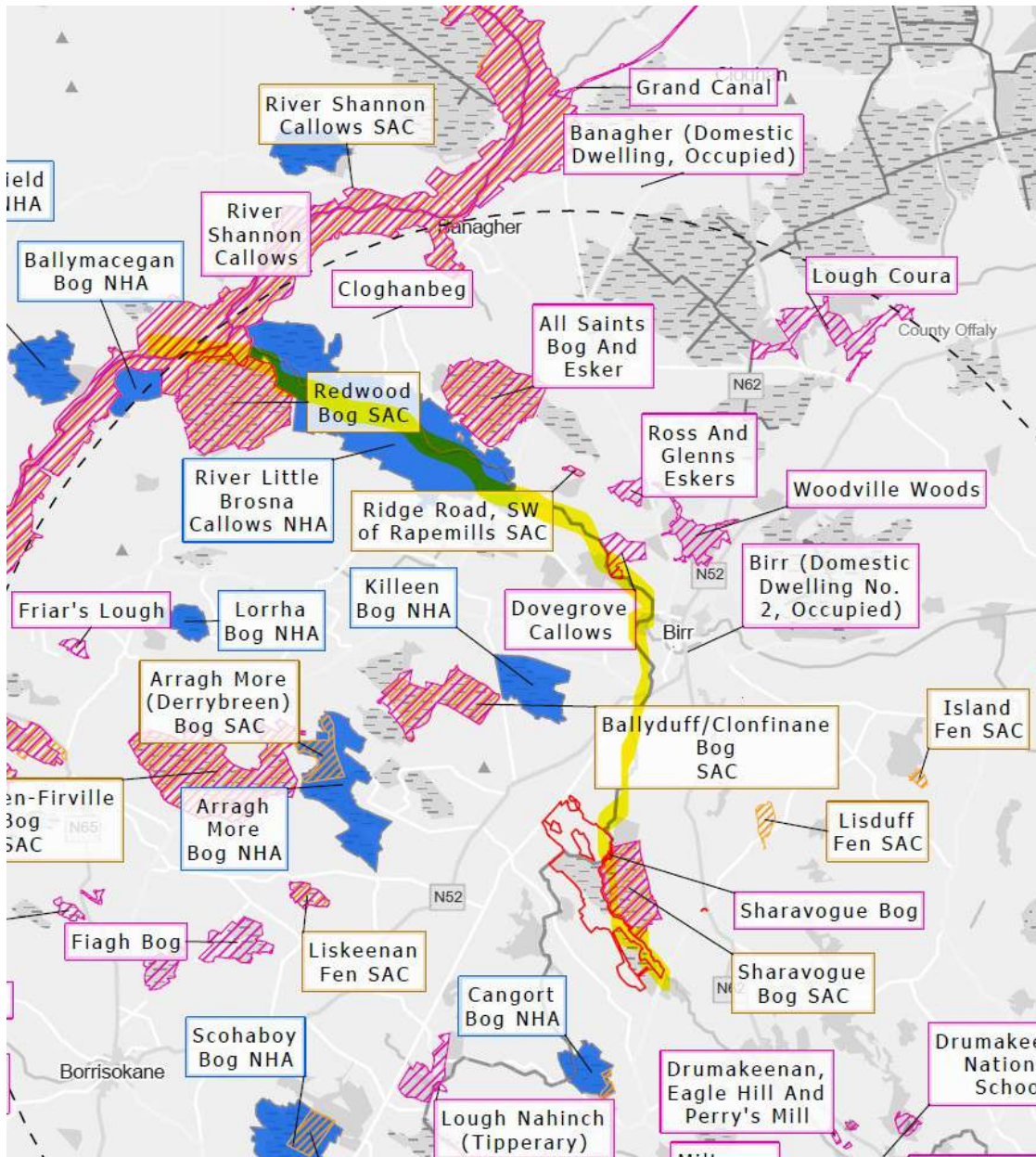
European Commission Guidance (2019, Section 4.7.3): 'The in-combination assessment should include all plans and projects that could in combination with the project under

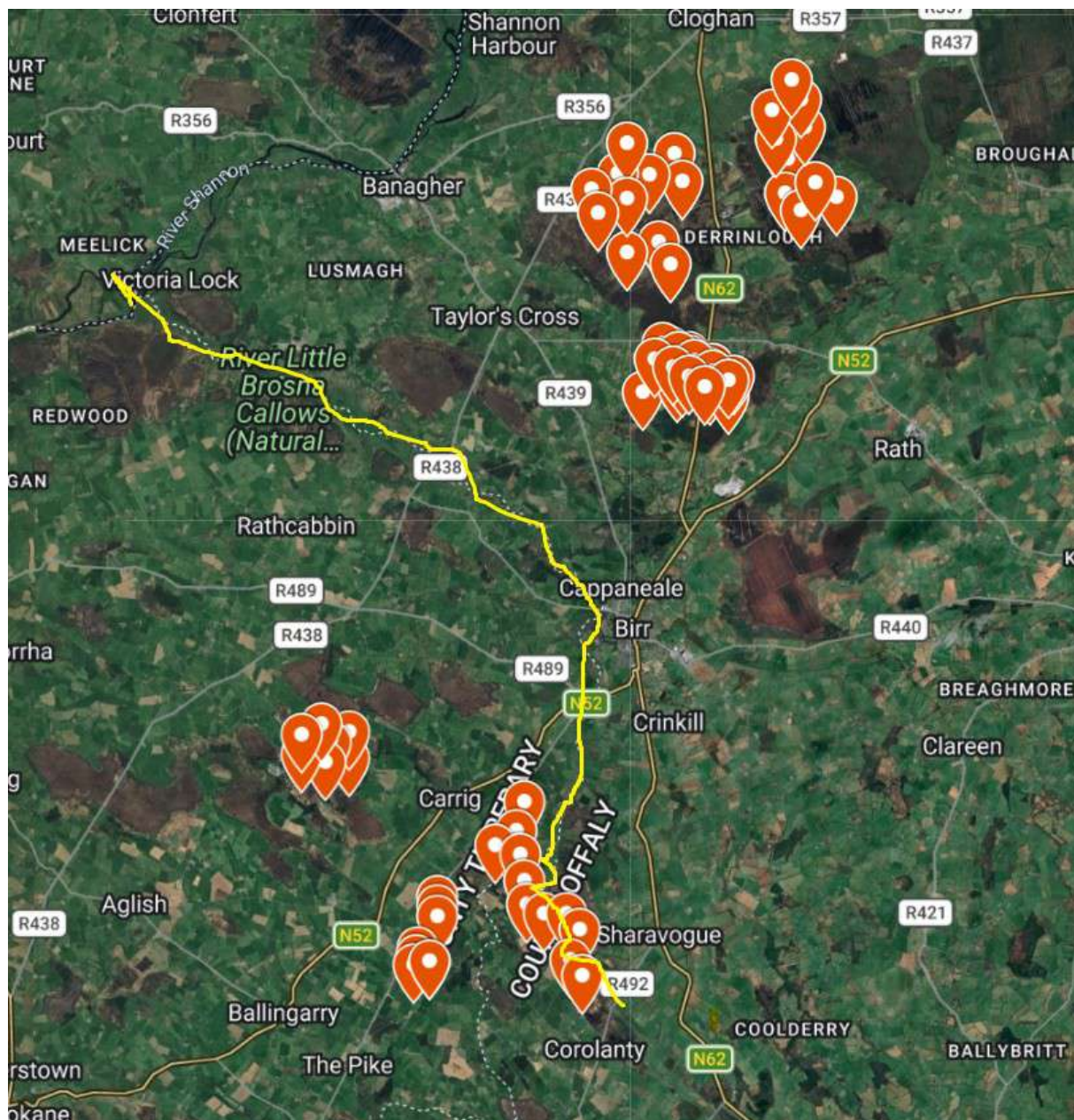
assessment affect the integrity of the Natura 2000 site, regardless of whether those other plans and projects have already been assessed and consented.' A prior nil-effects conclusion from another developer does not remove a development from the scope of in-combination assessment.

The last point from the Commission Guidance is critical for Ballincor. In this instance the developer's approach is to cite the other development's own NIS conclusion of nil residual effects and on that basis conclude that, added together, the combination also produces nil effects which is the logical equivalent of arguing that because no single raindrop is responsible for a flood, there can be no flood.

The Commission's guidance explicitly states that this approach is insufficient — the in-combination assessment must be independent and must address cumulative effects even where each individual project has concluded it has no residual effects.

4.6.2 One Shared Ecosystem — Four Applications Each Arguing Only Their Own Case





This is the core structural argument. Ballincor, Carrig, Cush and Derrinlough are not four independent developments with separate ecological footprints. They are four applications within a shared ecosystem, drawing on the same finite populations of the same SPA qualifying interest species, assessed by four different consultants instructed by four different developers, each concluding that only their own project has any ecological consequence. → See Appendix 4-5, Part 1: Development Register.

The shared characteristics of this ecosystem are:

- The same finite SPA populations: Every golden plover, whooper swan, wigeon, lapwing, black-tailed godwit, teal, shoveler, pintail and Greenland white-fronted goose that uses the River Little Brosna Callows SPA draws on a population that is subject to collision mortality risk, disturbance and displacement from all four operational developments simultaneously.
- The same flightlines and movement corridors: The River Brosna corridor connects the site to the SPA. The midland bog SAC network links Sharavogue Bog SAC, Ballyduff/Clonfinnane SAC, Arragh More SAC and Kilcarren-Firville SAC. Birds moving along these corridors do not encounter one development — they encounter all of them.
- The same Zone of Influence: The developer's own NIS Table 6-13 places Carrig at 1.5km, Cush at 10km and Derrinlough at 13km. Each of these developments acknowledged in its own NIS that the River Little Brosna Callows SPA is within the Zone of Influence. They share the same Zone of Influence because they share the same SPA.
- The same NPWS regulatory concerns: The DAU has made materially identical submissions on Carrig and Cush — raising the same issues about nocturnal surveys, in-combination effects, whooper swan flightlines, curlew individual significance, SPA connectivity defaults, and avoidance rates. These concerns were not project-specific. They reflect the DAU's view of the entire Zone of Influence.

Despite all of this, each application has been assessed in isolation. Each developer's cumulative assessment consists of a review of other developers' NIS conclusions. No developer has calculated the combined collision mortality across the Zone of Influence. No developer has assessed the additive displacement and barrier effects across the shared corridor. No developer has presented a combined disturbance and fragmentation assessment for the SAC network. This section does what no developer has done: it presents the combined picture. → See Appendix 4-5, Part 2: Combined Collision Mortality and Part 4: The Structural Gap.

4.6.3 Additive Collision Mortality — The Combined Figure No Developer Has Calculated

Every figure in this section is drawn directly from the developers' own formally submitted CRM documents. This is deliberate — the intention is to demonstrate that even accepting the developers' own numbers at face value (for reasons presented

previously – we do not), the combined picture is incompatible with the conservation objectives of the River Little Brosna Callows SPA. These figures are not generated by this objection. They are the developers' own preferred central estimates, extracted from documents placed before competent authorities and individually described, in each case, as negligible.

The figures that follow are therefore minimum baseline estimates derived from datasets that are themselves likely to understate actual flight activity and actual collision risk. The true combined collision mortality is higher — potentially substantially higher — than the arithmetic below suggests. This is the floor, not the ceiling. It is presented as such.

→ Appendix 4-5, Table E2: Combined collision mortality tables.

4.6.3.1 Golden Plover — SPA Qualifying Interest, Unfavourable Conservation Condition, Combined Mortality Exceeds Recovery Threshold

The River Little Brosna Callows SPA I-WeBS five-year mean peak count for golden plover is 9,247 birds (2018/19–2022/23, Burke et al., 2026). The conservation condition is already unfavourable. The conservation objective does not merely require that this decline be arrested — it requires a stable or increasing long-term population trend, meaning the population must recover toward its baseline.

- **Derrinlough Wind Farm** 14.9 collisions per year at 98% avoidance (Derrinlough NIS, 2020). Assessed against the county population of 15,898 birds — not against the SPA local population of 9,247. Had it been assessed against the SPA population, the annual mortality increase would be approximately 0.6% — above the level Derrinlough itself described as the threshold of concern, and nearly double the figure its own assessment presented. Described as negligible.
- **Ballincor Wind Farm** 7.9–9.4 collisions per year at 99.6% avoidance (Ballincor CRM, Table 4.1). The developer's own upper uncertainty range exceeds the 1% local SPA population mortality threshold. This exceedance was acknowledged and dismissed. Described as negligible.
- **Cush Wind Farm** 24.27–93.90 collisions per year at 98% avoidance (Cush NIS figures cited in NPWS/DAU Cush letter, March 2024). The NPWS/DAU

calculated that this represents an annual mortality increase of 1.76%–6.81% on the local SPA population of 5,110 birds — already breaching the 1% threshold at the central estimate before a single other development is considered. Described as negligible.

- **Carrig Wind Farm** 1.17–2.35 collisions per year at 99.6–99.8% avoidance. No population-level significance assessment was conducted in the Carrig application. The figure was placed in the CRM and not carried forward to any threshold test. Described as negligible.

Applied to the SPA local population of 9,247 birds, this represents an annual mortality increase of approximately **3.6–8.7%**. Applied to the lower I-WeBS count of 5,110 birds used in the NPWS/DAU Cush letter, the annual mortality increase is **6.4–15.5%**. The lower bound of this range — 3.6% annual mortality increase on a population already 50% below its designated baseline — is nine times the 1% threshold that each developer individually described as highly precautionary before dismissing it. The upper bound is thirty-nine times that threshold.

This figure has never appeared in a single document submitted to any competent authority. Each developer calculated their own number, described it as negligible, and submitted it. No developer, no planning authority, and no statutory consultee has placed all four numbers in the same column and added them up. This section does that for the first time.

The structural absurdity of the current approach is most clearly visible in the avoidance rate asymmetry. Derrinlough used the 98% default avoidance rate, which the same CRM author — appointed by Ballincor — subsequently argued in the Ballincor and Carrig CRMs should be replaced by 99.6–99.8% on the basis of post-construction monitoring evidence from UK wind farms. If the 99.6% rate is scientifically correct — and it is the rate applied in both the Ballincor and Carrig CRMs — then Derrinlough's figure of 14.9 collisions per year is a significant overestimate and the true Derrinlough contribution may be closer to 3–5 collisions per year. But if the 98% rate is

applied consistently across all four developments — as Derrinlough's own assessment implies it should be — then Ballincor and Carrig's figures of 7.9–9.4 and 1.17–2.35 respectively would be replaced by figures five to ten times higher, and the combined total would not be 48–121 collisions per year but **200–400 or more**. The developers have been permitted to choose whichever avoidance rate produces the lowest number for their own site, with no requirement for methodological consistency across the cluster. The combined figures above are the arithmetic result of accepting each developer's own preferred assumption. They are the most generous interpretation of the available evidence. They are still incompatible with the SPA conservation objectives.

For a species already in unfavourable conservation condition, 50% below its SPA designation baseline, with a conservation objective that legally requires population recovery, an additive annual mortality of between 3.6% and 15.5% from four adjacent developments is not a marginal or borderline concern. It is a structural obstacle to the achievement of the conservation objective. No developer has assessed it as such. No competent authority has been presented with it as such. This submission presents it now. → Appendix 4-5, Table E2.

4.6.3.2 Whooper Swan — A Corridor of Four Developments Across a Single Established Flightline

The structural problem for whooper swan is geographic rather than arithmetic. Each of the four developments lies along or adjacent to the River Brosna corridor that connects the NPWS-managed Sharragh roost — 63 hectares of managed wetland directly adjacent to both Ballincor and Carrig, documented as a regular nighttime roosting site for whooper swan — to the River Little Brosna Callows SPA 7–8km to the north. A bird roosting at Sharragh and feeding on the SPA callows does not choose which wind farm to fly past. It flies the corridor. Ballincor and Carrig sit at the southern end, 1.5km apart. Derrinlough lies further north. Cush lies to the northwest. The corridor is not a metaphor — it is the documented movement route for an Annex I species that is a qualifying interest of the SPA, and it now contains four wind energy developments at various stages of consent.

The Ballincor CRM central estimate for whooper swan is 0.02–0.05 collisions per year. The Carrig CRM (Table 7-5-5, Scenario 1, 99.5% avoidance) produces a central estimate **of 0.07 collisions per year** — three times Ballincor's figure, reflecting Carrig's substantially higher recorded whooper swan flight activity of 7,652 bird-seconds at potential collision height compared to Ballincor's lower recorded activity. This difference is itself informative: the two sites are 1.5km apart and surveyed the same population of birds, yet their recorded flight activity differs significantly, suggesting that the spatial distribution of whooper swan movement is highly localised and that VP coverage gaps at either site are likely to have produced material underestimates.

From Ballincor and Carrig alone — the two southernmost developments, forming a paired obstacle across the Sharragh–SPA corridor — the combined annual whooper swan collision estimate is **0.09–0.12 collisions per year**, or approximately one bird every eight to eleven years. For a species whose entire Little Brosna Callows SPA local wintering population is 337 individuals, a combined mortality rate of one bird per decade from two adjacent developments represents approximately 0.3% of the local population per year — approaching the 1% threshold when uncertainty ranges and nocturnal under-detection are applied.

Comparable CRM figures for Cush and Derrinlough are not fully available in the reviewed documents. But both applications identified whooper swan disturbance and displacement pathways to the SPA in their NIS. Adding even conservative estimates for those two developments — each of which surveyed the same population using the same daytime-only methodology — would push the combined figure further. More importantly, displacement and barrier effects compound in a way that collision risk arithmetic cannot fully capture: a bird diverted around one wind farm arrives at the next. A species habituated to a flightline that now contains four turbine clusters does not simply recalculate its route. The evidence from across Europe is that repeated displacement from established flightlines causes population-level shifts in site use

over time, and that the Little Brosna Callows SPA local population — already at 337 individuals — has no margin for further attrition of any kind.

The diel coverage gap compounds catastrophically in this cumulative context. All four assessments are missing the same nocturnal and crepuscular periods during which whooper swan movement between roost and feeding grounds is most concentrated. It is not one dataset with a gap. It is four assessments with the same gap, stacked across the same flightline. The combined effect of that shared omission is not additive — it is multiplicative. The more developments share a flightline and the more all their datasets share the same structural absence, the further the combined collision risk estimate is from reality.

4.6.3.3 Other SPA Qualifying Interest Species — The Unassessed Aggregate

The picture that emerges is consistent: every species for which both a Ballincor and a Carrig figure is available shows a combined mortality that is higher — in some cases substantially higher — than either developer acknowledged individually.

Lapwing is a qualifying interest of the Little Brosna Callows SPA. The Carrig CRM predicts 2.94 collisions per year at 98% avoidance (Scenario 1, Table 7-5-5). The Ballincor CRM predicts 1.4–1.6 collisions per year at the same avoidance rate. Combined from these two adjacent developments alone: **4.3–4.5 lapwing collisions per year**, before Derrinlough — which explicitly identifies lapwing disturbance pathways to the SPA in its NIS — or Cush is considered. The local Little Brosna Callows SPA lapwing population is 5,637 birds (I-WeBS data, Burke et al., 2026). The two-development combined figure represents approximately 0.08% annual mortality on the local SPA population — modest in isolation, but this is again the floor figure, before two further developments, before nocturnal under-detection correction, and before the species' already declining national trend is weighted.

Curlew — an Annex I species with approximately 105 breeding pairs remaining nationally — appears in both CRMs. The Carrig CRM predicts 0.003–0.006 collisions per year. The Ballincor CRM predicts 0.02 collisions per year. These figures appear small. They are not. With 105 breeding pairs, approximately 210–250 individuals, the loss of a single curlew from the Irish breeding population represents approximately 0.4–0.5% of the national total. The combined Ballincor–Carrig figure of 0.02–0.03 curlew collisions per year means a statistically expected curlew death from these two developments alone every 30–50 years. Over a 30-year operational lifetime, one curlew death from this paired development is the central expected outcome. One curlew death is 0.4–0.5% of the entire Irish breeding population, from two wind farms in the same townland. No cumulative assessment has placed this in a national population context. Neither Derrinlough nor Cush CRM figures for curlew are available in the reviewed documents, but both identified curlew as a species present in the survey area.

Black-tailed godwit — a qualifying interest of the Little Brosna Callows SPA, with a local population of 3,553 and a national population of 24,790 — is predicted by the Ballincor CRM to incur 3.3–4.7 collisions per year at the central estimate, which already exceeds the 1% local SPA population mortality threshold. The Carrig CRM does not present a godwit figure because the species was not recorded at potential collision height during the Carrig survey. This absence is not reassuring — it is another data gap. The two sites are 1.5km apart. A species that breaches the 1% mortality threshold in the Ballincor CRM, whose SPA foraging habitat lies between the two sites, and which was simply not observed in the Carrig survey at collision height, is not demonstrably absent from Carrig's collision zone. It is undetected in Carrig's survey. The combined figure for black-tailed godwit therefore cannot be calculated from the available evidence — but the Ballincor figure alone already exceeds the threshold before any other development is added.

Wigeon, teal, shoveler, and Greenland white-fronted goose remain entirely unquantified in the cumulative context. All four are qualifying interests of the Little Brosna Callows SPA. All four are identified in multiple NIS documents across the four applications as species for which disturbance and displacement pathways to the SPA

exist. Each developer concluded that its own mitigation blocked those pathways. No developer has modelled what happens when four sets of mitigation are simultaneously in place across the same corridor — whether a species displaced from one site by operational turbines arrives at the next site's turbines, is displaced again, and has nowhere left within its foraging range that is free of operational wind energy infrastructure. For Greenland white-fronted goose — 180 birds in the Little Brosna/Dovegrove flock, down 66% from the designation baseline, subject to a restoration conservation objective — this is not a theoretical question. It is the defining conservation challenge for this population, and it has not been addressed by any of the four developers, individually or in combination.

The cumulative picture across all species and all four developments is therefore this: on the developers' own minimum-estimate figures, the combined collision mortality for golden plover alone is incompatible with SPA population recovery. For whooper swan, lapwing, curlew, and black-tailed godwit, the combined figures — where they can be assembled — consistently exceed what any individual developer acknowledged. For wigeon, teal, shoveler, and Greenland white-fronted goose, the combined figure has never been calculated by anyone. And all of this rests on survey data that is structurally incomplete in the same way, across all four applications, for the same species, at the same times of day. The floor is already broken. The ceiling has not been examined.

The in-combination assessment also omits a major non-wind development immediately adjacent to the site. Dr Moran (Appendix 4-6) records that a query of the EIA portal identifies a Strategic Infrastructure Development for which Uisce Éireann has given notice of intention to apply to An Coimisiún Pleanála (competent authority reference PA92.323980), comprising a raw water intake and pumping station, a water treatment plant, and associated infrastructure, together with approximately 172 km of pipeline and associated electricity works, running between County Tipperary and County Dublin. The potential impact of that project on proximate SPAs, including the River Little Brosna Callows SPA, has itself been identified in its own EIAR and NIS. The Ballincor Ornithology Chapter and NIS contain no consideration of cumulative or in-

combination effects with this development. The failure even to identify, let alone assess, a Strategic Infrastructure Development of this scale affecting the same SPA must be construed as a fundamental deficiency in the in-combination assessment — one that is independent of, and additional to, the absent cumulative assessment of the four wind energy developments set out above.

4.6.4 Construction Phase Cumulative Impacts

The cumulative assessment problem is not limited to the operational phase. The Ballincor construction programme (estimated January 2027 onward, based on EIAR Chapter 4) overlaps with the Carrig construction programme for a significant period. Both sites are within 5km of each other, both involve heavy vehicle movements across the River Brosna corridor, and both will generate construction-phase disturbance to breeding birds on and around the shared SAC network.

For a species such as curlew — with confirmed breeding in the shared Zone of Influence in 2021 and 2025, and approximately 105 breeding pairs nationally — the cumulative construction disturbance from two wind farms within 5km, during the same breeding season, may represent the most significant individual threat to that breeding population from any single event in many years. This has not been assessed by either developer. → Appendix 4-3, SectionC4.2: Curlew — construction phase disturbance.

Similarly, merlin — confirmed breeding on Ballyduff/Clonfinnane SAC in 2025, with a foraging range overlapping both development zones — faces simultaneous construction disturbance from two directions during the breeding season. Neither the Ballincor nor the Carrig EIAR addresses this combined breeding-season pressure. → Appendix 4-3, SectionC4.3: Merlin.

4.6.5 Additive Displacement and Barrier Effect — The Corridor Under Pressure

Displacement and barrier effects differ from collision mortality in an important respect: they are not additive in a simple arithmetic sense — they are spatially compounding. A species displaced from a feeding site by one development may fly into the zone of influence of the next. A migratory species deflected from its flightline by one turbine cluster may be deflected into another. A breeding pair driven from its foraging range by construction at one site may find that the alternative foraging range is within the construction zone of the neighbouring development.

The River Brosna corridor illustrates this precisely. From south to north, it passes through: the Carrig/Ballincor combined turbine zone (18 turbines within 5km), then open callows and farmland, then the Cush development (8 turbines, 10km further). A species using this corridor — whooper swans commuting from the Sharragh roost to the SPA, golden plover flocks moving between feeding areas, Greenland white-fronted geese passing on migration — encounters turbine infrastructure at both ends of the corridor. The combined barrier and displacement effect on species using this corridor is greater than the sum of each individual development's effect, because the alternative routes become progressively narrower as each development is added.

No developer has modelled this spatially compounding displacement effect. Each NIS concludes that alternative habitat is available in the wider landscape — but as the cluster of developments grows, the area of undisturbed alternative habitat shrinks. Derrinlough (21 turbines) took its share of the alternative landscape in 2021. Cush (8 turbines) took more in 2024. Carrig (7 turbines) took more in 2025. Ballincor proposes 11 more. The landscape absorbs each development individually as though the others did not exist. → Appendix 4-5, SectionE3: Cumulative structure failure; Appendix 4-5, SectionE4: Summary — The Structural Gap.

4.6.5.1 The SAC network corridor

The midland bog SAC network — Sharavogue Bog SAC, Ballyduff/Clonfinnane SAC, Arragh More SAC, Kilcarren-Firville SAC and Redwood SAC — forms an ecological corridor approximately 15km in length through the Offaly/Tipperary border region. The Ballincor turbines would be sited at the northern end of this corridor, between

Sharavogue SAC and the SACs to the south. Carrig lies 5km to the southeast. Together they create a turbine presence across both ends of the corridor's northern section.

For merlin, curlew and hen harrier — species that breed on or move between the bog habitats within this network — the cumulative barrier effect of Ballincor and Carrig is qualitatively different from either development alone. A single 11-turbine wind farm is a barrier. An 18-turbine combined infrastructure across the corridor is a fragmentation. The difference matters ecologically. Neither developer has assessed the combined corridor fragmentation effect. → Appendix 4-3, Section C4.11: Habitat Connectivity; Section 4.11 of this chapter.

4.6.6 The Regulatory Authority's Own Statement — DAU Verbatim

This section presents the statements of the NPWS Development Applications Unit, in its own words, on the adequacy of cumulative and in-combination assessment for wind farm developments in this Zone of Influence. These are not interpretations of the DAU's position — they are direct quotations from formal submissions to An Coimisiún Pleanála on applications within the same shared ecosystem. They constitute the most authoritative available statement of the regulatory standard that applies.

NPWS/DAU submission on Cush Wind Farm (ABP-318816-24, 1 March 2024) — on in-combination effects:

"The Department considers that the risk to birds on migration of being involved in collisions with the proposed wind farm in its operational phase has not been satisfactorily evaluated by the applicant. Additionally, in-combination effects of several wind farms across this area on migrating birds has not been assessed."

Significance for this application: This statement was made in March 2024 — after the Ballincor survey programme was underway and before the Ballincor application was submitted. The in-combination gap identified for Cush was not closed before Ballincor was submitted. The gap the DAU identified exists, unchanged, in the Ballincor NIS. When the DAU states that in-combination effects 'have not been assessed,' that statement applies to the entire Zone of Influence — including Ballincor.

NPWS/DAU submission on Cush Wind Farm — on SPA connectivity:

"Due to the proximity of the SPAs to the project site and a lack of any scientific evidence to the contrary, and in accordance with the precautionary principle, the Department considers that it must be assumed that these birds are part of the SPA populations and therefore there is ecological connectivity to these sites."

Significance for this application: The Ballincor NIS does not adopt this default. It requires evidence of connectivity before treating birds on the site as SPA birds. The DAU's instruction — that the precautionary principle requires the opposite assumption — applies to Ballincor with identical force. The developer's cumulative assessment cannot stand on a connectivity assumption that the regulatory authority has explicitly rejected.

NPWS/DAU submission on Carrig Wind Farm (ABP-318689-23) — on the Zone of Influence:

"The Department does not accept the findings of the EIAR/NIS in relation to a 5km core range for bird species. The Department considers it entirely possible that there may be movement between the sites, constituting ex-situ usage of the development zone of influence by qualifying interest species from the SPA."

Significance for this application: The Carrig submission was made in respect of a development at 1.5km from Ballincor. The DAU's rejection of the 5km core range assumption applies directly to Ballincor — a development at the same location in the same shared ecosystem. The cumulative assessment in the Ballincor NIS is premised on a Zone of Influence assumption the DAU has stated it does not accept for this precise area.

NPWS/DAU submission on Carrig Wind Farm — on whooper swan and the flightline:

"It is proposed to locate the turbines within a pre-existing regularly used whooper swan flight line. These birds could be displaced or if they maintain current usage be at greater than normal collision risk. The Dept. also notes extensive flight observations of other protected bird species in the proposed turbine area."

Significance for this application: The established whooper swan flightline identified by the DAU in its Carrig submission passes through the Ballincor Zone of Influence. The Sharragh roost — NPWS-owned land, cited by the DAU in the same submission — is shared between the Carrig and Ballincor development zones. The cumulative displacement and collision risk on this flightline from both developments combined has not been assessed.

NPWS/DAU submission on Carrig Wind Farm — on curlew individual significance:

"Collision mortality or displacement could be considerable for species which are already in serious decline, e.g. there are c.105 breeding pairs of curlew left in Ireland, therefore the loss of one pair would equate to almost 1% of the national breeding population."

Significance for this application: This statement on curlew individual significance was made by the DAU in the context of the Carrig application — 1.5km from Ballincor. The same species, the same population, the same DAU position. The cumulative risk to curlew breeding in the corridor between and around the two developments has never been assessed.

The DAU statements above span both the Carrig and Cush applications, covering the full geographic range of the Zone of Influence within which Ballincor sits. They consistently identify: inadequate survey methodology; rejected Zone of Influence assumptions; inverted SPA connectivity defaults; unassessed in-combination effects; and individual species significance requirements not met by collective assessment. None of these concerns has been closed in the Ballincor application.

4.6.7 The Circular Structure of Developer Cumulative Assessment

The Ballincor NIS cumulative assessment follows a consistent structure for each development reviewed. The structure is:

- Step 1: Identify the other development in the 20km cumulative assessment radius.
- Step 2: Note that the other development's own NIS concluded no significant residual effects.
- Step 3: Conclude that since neither the other development nor Ballincor has residual effects individually, the combination also has no residual effects.
- Step 4: Proceed to the next development and repeat.

The exact language used in the Ballincor NIS for each development entry follows the same template. For Carrig (NIS Section 6.3.1.1):

Ballincor NIS Section 6.3.1.1 — on Carrig:

"...since the Carrig Wind Farm has no residual effects, its presence does not increase baseline pressures. Consequently, even with temporal overlap, the combination of the two projects does not result in additive or synergistic effects that would compromise site integrity."

The structural problem: This statement assumes as a baseline fact what the DAU challenged in its Carrig submission — that Carrig has no residual effects. The NPWS/DAU submitted detailed

ornithological objections to the Carrig application on the grounds that its assessment was inadequate. A development whose assessment was challenged by the regulatory authority as incomplete and inadequate has not been assessed as having 'no residual effects' in any meaningful regulatory sense. The Ballincor cumulative assessment treats the Carrig nil-effects conclusion as a settled fact; it is not.

For Cush (NIS Section 6.3.1.4):

Ballincor NIS Section 6.3.1.4 — on Cush:

"...since the Cush Wind Farm has no residual effects, its presence does not increase baseline pressures."

The structural problem: Cush was consented in November 2024, after the NPWS/DAU submitted a formal objection in March 2024 stating that the collision risk assessment for migrating birds 'has not been satisfactorily evaluated' and that in-combination effects 'have not been assessed.' Consent was granted notwithstanding these objections. But the grant of consent does not convert an inadequate assessment into an adequate one. It means the inadequacy now exists within the consented development baseline. The Ballincor developer treats Cush's consented status as equivalent to validated nil effects. It is not.

For Derrinlough (NIS Section 6.3.1.5):

Ballincor NIS Section 6.3.1.5 — on Derrinlough:

"...since the Derrinlough Wind Farm has no residual effects, its presence does not increase baseline pressures. Spatially, the two projects are sufficiently separated, so there is no overlap in the areas of potential disturbance, displacement, or barrier effects."

The structural problem: The Derrinlough NIS (2020) itself acknowledged disturbance and displacement pathways to the River Little Brosna Callows SPA and Middle Shannon Callows SPA for golden plover, whooper swan, wigeon, lapwing, black-tailed godwit, teal and shoveler. It then concluded that mitigation blocked these pathways. The claim of 'no overlap in areas of potential disturbance, displacement, or barrier effects' is inconsistent with Derrinlough's own acknowledgement of pathways to the same SPA.

The cumulative consequence of this circular structure is that each developer's nil-effects conclusion becomes the next developer's baseline. The cumulative burden on the SPA grows with each consented development, but the baseline against which each new application measures its incremental effect remains at nil — because each predecessor claimed nil. This is circular by construction. It guarantees nil cumulative impact regardless of the actual aggregate burden. → Appendix 4-5, Part 4: Summary — The Structural Gap.

4.6.8 Conclusion — Absent, Not Merely Inadequate

Section 4.6 has demonstrated the following:

- The legal requirement for in-combination assessment under Article 6(3) is not satisfied by accepting each other developer's nil-effects conclusion as a baseline fact. The European Commission's guidance explicitly states that in-combination assessment must be independent and must address cumulative effects even where each individual project has concluded it has no residual effects.
- Ballincor, Carrig, Cush and Derrinlough draw on the same finite SPA populations. The combined additive collision mortality across three of these developments (Derrinlough, Ballincor, Cush — excluding Carrig) is 46.8–118.3 golden plover collisions per year on a population already 50% below its SPA baseline reference values. This figure has never been presented to any competent authority in a single document.
- The additive displacement and barrier effect on the River Brosna corridor and the midland bog SAC network is qualitatively different from — and greater than — the sum of each individual development's displacement impact. No developer has modelled this spatially compounding effect.
- The NPWS/DAU has explicitly stated, in formal submissions on two applications within the same Zone of Influence, that in-combination effects 'have not been assessed.' This is not a finding specific to Cush or Carrig — it is the DAU's assessment of the entire Zone of Influence.
- The developer's cumulative assessment methodology — accepting each predecessor's nil-effects conclusion as a settled baseline — is circular by construction and produces nil cumulative impact regardless of the actual aggregate burden.

The cumulative assessment is absent, not inadequate. What the NIS offers is a template paragraph, repeated for each development, asserting that because every predecessor claimed nil effects the combination must also be nil. That is not an assessment; it is the assumption of its own conclusion. No independent calculation of the matters set out above has been performed, and the DAU's express finding that in-combination effects "have not been assessed" stands unanswered. On this material, An Coimisiún Pleanála cannot discharge its obligation under Article 6(3) of the Habitats Directive.

4.7 Conclusions and Grounds for Refusal

There is a final observation that needs to be made. The developer's own raw survey data — the records in Appendix 7-1 when read on their own terms, before any modelling or analytical step is applied, present a picture of an active, heavily used wetland bird landscape. The appendices record golden plover flocks of 450 birds, Wigeon flocks of 600, repeated large-scale wintering waterbird activity across multiple seasons, records of species using the survey area for durations measured in hundreds and in some cases thousands of seconds, and extensive low-altitude movement along the River Brosna corridor by multiple SPA qualifying interest species. The North Corridor densities in CRM Table 3.4 are 4.7 to 8.0 times higher than the modelled remainder zone for four SPA qualifying interests.

This data is not the product of modelling assumptions, but the product of counting what the VP observers actually recorded. The overall ecological impression created by the raw data is not of a landscape with occasional, incidental waterbird usage. It is of an actively used wetland flight landscape with recurring large-scale wintering bird activity concentrated along a river corridor that passes directly through the proposed development zone. The assessment built on that same raw data concludes that adverse effects are negligible and can be excluded. The gap between what the raw data shows, despite the many deficiencies, and what the assessment concludes is itself a signal for scrutiny.

An Coimisiún Pleanála, as the competent authority required to ascertain — not merely suspect — that adverse effects can be excluded, should weigh the raw ecological record as the primary evidential baseline, and ask whether the analytical steps taken between that record and the assessment conclusion are complete, precise and definitive as Article 6(3) and Waddenzee require.

4.7.1 Summary of Principal Failures

This objection has examined the ornithological assessment submitted with the Ballincor Wind Farm application across five categories: survey methodology and effort; baseline species data; analysis and reasoning; protected species assessment; and cumulative impact. In each category, material and significant deficiencies have been identified — not from external sources, but from the developer's own documents, the developer's own CRM author's own admissions, and the NPWS/DAU's own submissions on comparable applications in the same Zone of Influence. The five categories are briefly summarised here before the numbered grounds are set out.

1. **Methodology.** Eight of nine survey seasons were conducted with surveys concentrated in the middle of the day, no dawn or dusk coverage in summer, near-zero dusk coverage in winter, no height band classification, non-compliant watch durations, concurrent watches violating statistical independence, and no nocturnal surveys, acoustic monitoring or radar across any season. Turbine T5 falls outside all viewsheds at all heights in all nine seasons. Summer 2022 is entirely absent. The Brosna North Corridor — the zone of highest bird activity for four SPA qualifying interest species, with densities 4.7 to 8.0 times higher than the remainder zone — was excluded from the CRM without any commuting flight analysis to fill the gap. These are not peripheral shortfalls — they are structural characteristics of the dataset on which the entire CRM is built, all of which consistently suppress data from the periods and places where bird activity is highest. → *Section 2; Appendices 4-1, 4-2, 4-4.*
2. **Baseline.** Several SPA qualifying interest species received CRM modelling but were then excluded from any population-level significance assessment on a fewer-than-ten-records threshold that is itself a direct consequence of the survey methodology failures described above. The threshold is not applied consistently — black-tailed godwit, with fewer than ten records, was retained in the CRM because its single large-flock observation produced high estimates; pintail, with two nationally important counts at the same location in the same month of different years, was dismissed without individual assessment. The 2025 BirdWatch Ireland breeding survey on the adjacent SAC confirmed breeding Annex I species that the developer's programme — which deployed no acoustic monitoring — failed to detect. → *Section 2.5; Section 3.1; Appendix 4-3.*
3. **Analysis.** The CRM's conclusions rest on an avoidance rate challenged by the regulatory authority as inapplicable to this turbine scale and landscape type; a population denominator assessed at national rather than SPA scale in ways that understate significance; displacement distances derived from smaller turbines in

different landscapes; a connectivity default that inverts the precautionary principle; a 1% mortality threshold repeatedly invoked to dismiss near-threshold findings for a species already in unfavourable conservation condition; and five specific logical inconsistencies where acknowledged data gaps are carried to no-impact conclusions without supporting analysis. The CRM identifies 25 separate limitations, caveats and uncertainties in its own dataset and model. → *Section 3; Appendix 4-2.*

4. **Species assessment.** Priority species — whooper swan, curlew, merlin, white-tailed eagle and golden plover — each receive assessments this objection has demonstrated are inadequate. For curlew and merlin, post-submission field evidence directly contradicts the developer's assessment conclusion. For white-tailed eagle, the 1% annual mortality threshold was applied to a national wild population of 150 individuals — precisely the category the CRM's own author identified as the class of case where the threshold is biologically implausible. For golden plover, the assessment does not ask whether the development undermines recovery potential for a population already at 50% of its baseline reference value. A further seven species of significant conservation status are assessed in ways inconsistent with their national population sizes or regulatory status. → *Section 4; Appendix 4-3.*
5. **Cumulative impact.** The in-combination assessment in the NIS is not inadequate — it is absent. No developer in the Zone of Influence has calculated combined collision mortality from the four primary developments on the shared SPA populations. The combined figure from three developments alone — 46.8–118.3 golden plover collisions per year on a population already 50% below its SPA baseline — has never appeared in a single document submitted to any competent authority. The NPWS/DAU has stated directly that in-combination effects across this area have not been assessed. → *Section 5; Appendix 4-5.*

4.7.2 Eleven Grounds for Refusal

- **Ground 1 — Survey Methodology.** The dominant eight-season Ecology Ireland dataset cannot support a complete and definitive Appropriate Assessment. Surveys were concentrated in the middle of the day, with zero dawn and dusk coverage in summer, near-zero dusk coverage in winter, absent height band classification, non-compliant watch durations, and concurrent watches violating the statistical independence assumptions of the NatureScot model. No nocturnal surveys, acoustic monitoring or radar were conducted in any season. The CRM author acknowledges methodology deviation in Section 1.5 and the inability to calculate recording rates for dawn and dusk

periods in Section 3.4.3. Tobin Dataset represents 1 season. The addition of one high-quality season does not retrospectively validate eight deficient seasons.

- **Ground 2 — The Highest-Density Activity Zone & Spatial Coverage.** The Brosna North Corridor — where bird densities for four SPA qualifying interest species are 4.7 to 8.0 times higher than the modelled zone — was excluded from the Collision Risk Model with no commuting flight analysis to replace it. Turbine T5 falls outside every viewshed at every height in every season. There is no empirical flight activity data at collision height for this turbine location anywhere in the survey programme. The two places in this landscape where collision risk is most concentrated are the two places the assessment does not reach.
- **Ground 3 — Nocturnal, Acoustic and Radar Surveys: Total absence.** No nocturnal surveys. No acoustic monitoring. No radar. Not in any season, for any species, at any point in a nine-season programme. The regulatory authority has stated explicitly that the full impact of a development of this kind cannot be assessed without this information. The only methodology that would have detected confirmed Annex I breeding within the foraging range of the development was never deployed. Seven species in the CRM have their nocturnal activity estimated from literature values because no site data exists. This is not a gap — it is a void.
- **Ground 4 — Curlew and Merlin: Collective Assessment of Nationally Critical Species Alongside Common Species is Not Lawful.** BirdWatch Ireland 2025 confirmed breeding merlin — an Annex I species — on the SAC 2.8km from the proposed turbines in May and June 2025. The nest was located. The confirmed breeding pair forages across a range that overlaps the turbine zone directly. Curlew, a Red-listed species with approximately 105 breeding pairs nationally, was confirmed present on the same SAC during the breeding season. The loss of one pair is almost 1% of the national population, the regulatory authority has said so explicitly, for this location. Merlin is an Annex I species confirmed breeding within the foraging range of the development. Both are assessed collectively alongside coot, common gull and herring gull. No individual collision risk assessment. No targeted breeding survey. No breeding disturbance analysis. No population-level significance assessment. The inference of limited site use from low record counts is directly contradicted by the survey methodology failures and

by the 2025 breeding confirmation. This collective treatment has no legal or ecological justification.

- **Ground 5 — Small-Population Species: The 1% Annual Mortality Threshold Cannot Lawfully be Applied to a National Wild Population of 150 Individuals.** The entire wild Irish white-tailed eagle population is approximately 150 individuals. The CRM's own author acknowledges the 1% threshold may be biologically implausible for small populations with low mortality rates. White-tailed eagle was excluded from any population-level significance assessment before the threshold was even reached. One dead eagle over the operational lifetime of this wind farm represents a meaningful fraction of the entire national population of a species recovering from functional extinction. A threshold designed for abundant, stable populations is not a complete or definitive assessment tool for a species in this position. The same structural failure applies to hen harrier, for which no population data was assembled in the CRM at all.
- **Ground 6 — Golden Plover: Inapplicable Avoidance Rate; Unfavourable Conservation Condition; Recovery Trajectory Not Assessed.** The 99.6% avoidance rate applied for golden plover has been explicitly challenged by the regulatory authority as derived from turbines half the size of those proposed, in landscapes entirely unlike this one. The SPA population is already in unfavourable conservation condition — 50% below its baseline reference values. The upper uncertainty range of the developer's own collision estimate already exceeds the 1% local SPA population mortality threshold. The assessment addresses only whether the central estimate at the preferred rate clears a threshold the CRM itself describes as precautionary. It never asks whether the development undermines the population's potential for recovery to favourable conservation status. That is the question the conservation objectives require to be answered. It was not asked.
- **Ground 7 — Whooper Swan: CRM Admits Potential Under-Estimation; Established Flightline Through the Development Zone Unassessed.** The CRM's own author acknowledges that uneven diel coverage may have caused under-estimation of whooper swan collision risk. An established communal roost connected to the SPA by a documented flightline through the development Zone of Influence generates pre-dawn commuting traffic that is entirely unrecorded across all nine seasons. Physical evidence of repeated collision on this flightline exists — bird strike deflectors were

installed by ESB Networks on powerlines in the area. Having acknowledged potential under-estimation and confirmed an unassessed roost flightline, the EIAR concludes negligible impact. That step from acknowledged under-estimation to negligible conclusion is asserted, not demonstrated. Adverse effects on an Annex I SPA qualifying interest cannot be excluded on this basis.

- Ground 8 — Pintail and Analytical Inconsistency: Nationally Important Counts Dismissed Using Reasoning the Same CRM Refused to Apply to Black-tailed Godwit.**

Two nationally important pintail counts — at the same location, in the same month, in different years — were dismissed as a one-off event with no individual CRM modelling. Pintail is a SPA qualifying interest. The CRM's own logic, applied elsewhere to black-tailed godwit, holds that a large-flock record observed during surveys covering 1.5–2% of daylight hours may reflect regular use systematically missed. That logic was used to retain black-tailed godwit in the model. It was not applied to pintail. The asymmetry is unexplained. No lawful exclusion of adverse effects on a SPA qualifying interest species can rest on a dismissal that contradicts the developer's own internal reasoning.
- Ground 9 — No Operational Bird Mitigation and No Lawful Pathway to Adaptive Management.** No dedicated mitigation measures exist for the operational phase. None. The entire no-adverse-effects conclusion rests on the adequacy of the pre-consent assessment — which this submission demonstrates is structurally inadequate. For species where post-construction mortality is irreversible, post-consent discovery through monitoring is not a recoverable position. The bird monitoring programme contains an adaptive management trigger, but the regulatory authority has stated directly that it cannot approve changes or conditions after consent is granted. The trigger has nowhere to go. The mechanism to act on monitoring findings does not exist. There is no backstop.
- Ground 10 — Cumulative Impact: The In-Combination Assessment is Absent, Not Merely Inadequate.** Each developer accepted the previous developer's nil-effects conclusion as a settled baseline and concluded that nil plus nil equals nil. European Commission guidance explicitly states this is insufficient. The combined golden plover collision mortality from three developments in this Zone of Influence is 46.8 to 118.3 birds per year on a population already 50% below its SPA baseline — between nine and

thirty-nine times the threshold each developer individually dismissed as precautionary. This figure has never been presented to any competent authority in a single document. The regulatory authority stated in March 2024 that in-combination effects across this area have not been assessed. That statement remains true of this application.

- **Ground 11 — IROPI Waiver.** Both derogation pathways under Article 6(4) of the Habitats Directive have been expressly waived by the developer. If adverse effects on site integrity cannot be excluded following a complete and legally compliant assessment, refusal is the only lawful outcome available to An Coimisiún Pleanála.

4.7.3 The burden of proof has not been discharged.

Under Article 6(3) of the Habitats Directive as interpreted by the Court of Justice in Waddenzee (C-127/02) and confirmed in Sweetman (C-258/11), the burden of proof in an Appropriate Assessment lies entirely with the applicant. An Coimisiún Pleanála can agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site. The precautionary principle applies: where scientific doubt remains after a complete assessment, that doubt must resolve in favour of conservation. The applicant must demonstrate — not merely assert — that adverse effects can be excluded. The survey programme submitted with this application is structurally incapable of providing that demonstration for the dawn and dusk periods when the priority species in this landscape are most active. The CRM built on it contains 25 acknowledged limitations and uncertainties. Species with national populations so small that no individual can be treated as statistically insignificant were excluded from population-level assessment before the 1% threshold was applied. New evidence confirms breeding Annex I species in the Zone of Influence that the developer's surveys failed to detect. No operational bird mitigation exists. The cumulative impact has never been calculated. The burden of proof has not been discharged. Refusal is the only available lawful outcome.

APPENDIX g: The Barn Owl

Chapter 5 : The Barn Owl

5.0 Introduction

This chapter addresses Barn Owls as a discrete concern, separate from the general ornithological assessment, for three reasons:

- First, separate treatment is what the NPWS required in its scoping response. It identified the site as falling within a BirdWatch Ireland sensitivity zone for Barn Owl and called specifically for detailed and species-specific Barn Owl survey, with mitigation to follow if impacts were identified. The regulatory expectation was therefore a dedicated Barn Owl assessment in its own right. An objection that mirrors that structure tests the application against the standard actually set for it.
- Second, the ecological context demands it. West County Offaly has been identified by Lusby et al. (2022) as holding the highest density of breeding Barn Owls in Ireland, and the 10km square containing the majority of this site falls within the highest sensitivity band for Barn Owl on the national wind energy sensitivity mapping. A species that is nationally scarce, an estimated 562 to 702 breeding pairs across the entire country, but locally concentrated at exceptional density cannot be adequately assessed as a line item within a general bird survey. The site sits at the centre of one of the most important Barn Owl landscapes in the State. An independent review reflects that.
- Third, throughout this process and within the community no other bird has been raised as consistently, or as personally, as the Barn Owl. That is no accident: people see these birds around their own homes, roosting in their sheds, nesting in their outbuildings, hunting across their yards and fields at dusk. For the community here, the Barn Owl is not just an entry on a conservation list; it is a familiar presence in daily life, and its protection is felt as a personal matter rather than a technical one. The EIAR's own incidental records in Appendix 7-1, each generated when a suitable structure near the site boundary happened to be inspected, confirm what residents already know: that this is occupied Barn Owl country. The depth and consistency of local concern for this one species is itself a meaningful indicator of how present, and how valued, the Barn Owl is in this landscape.

The review is structured to directly address and rebut key assertions made in the Environmental Impact Assessment and Review (EIAR) Chapter 7 (Ornithology). It specifically addresses the sensitivity of Barn Owl to wind energy developments,

drawing on the most current available peer-reviewed science, national agency guidance, and established best-practice survey methodology.

The objection is advanced on six grounds.

- **Ground 1 — Failure to comply with NPWS scoping requirement.** The NPWS/DAU explicitly required detailed and specific Barn Owl surveys as a condition of the scoping process. None were conducted; the applicant substituted desk study and third-party consultation, which do not satisfy the regulatory requirement.
- **Ground 2 — Structurally inadequate survey methodology.** The applicant's own EIAR acknowledges that daytime VP surveys are incapable of detecting a predominantly nocturnal species, yet no nocturnal surveys, acoustic monitoring or dusk/dawn transects were conducted across a six-year survey period. The absence of data this produced was then used to conclude negligible collision risk — a circular argument that is methodologically untenable.
- **Ground 3 — No survey in the critical June/July window.** Absence of survey deems it impossible to detect calling juveniles and confirming whether breeding pairs have been successful. Breeding success is a prerequisite for any meaningful assessment of population-level impact, and its absence from the evidence base renders the impact assessment structurally incomplete.
- **Ground 4 — Collision risk assessment relies on incomplete and superseded evidence.** The EIAR's dismissal of Barn Owl collision risk rests almost entirely on hunting flight height — the 3–4m figure drawn from a 2015 charity position paper (Barn Owl Trust, 2015) — set against the 17m lowest blade sweep. In doing so it ignores the CIEEM best-practice guidance (Shawyer, 2012), which identifies elevated commuting flight between nest and foraging habitat, not low hunting flight, as the primary collision risk vector; and the peer-reviewed USGS/Ecosphere study (Diffendorfer et al., 2021), which identifies Barn Owl as among the five raptor species with the highest potential for population-level impacts from turbine collisions. A non-peer-reviewed source is relied upon for a single behavioural figure while the published guidance addressing the actual risk pathway is omitted..
- **Ground 5 — Internal contradiction between National importance finding and "not significant" conclusion.** The EIAR's own narrative concludes the local Barn Owl population is of National importance yet the impact matrices apply County importance and Medium sensitivity throughout, producing conclusions of not significant and

imperceptible that the applicant's own framework cannot sustain from a National importance starting point.

- **Ground 6 — Mitigation and monitoring incapable of detecting or responding to impacts.** MM90, the sole operational ornithology mitigation measure, names no species, sets no trigger threshold and specifies no adaptive management response; the Bird Monitoring Programme contains no Barn Owl content; and post-construction fatality monitoring relies on daytime dog searches without predator-proof fencing, meaning the adaptive management mechanism is contingent on detecting events the monitoring programme is structurally incapable of reliably generating.

5.1 Conservation Status of Barn Owl in Ireland

5.1.1 Legal Protection

Barn Owl (*Tyto alba*) is afforded the highest level of protection under Irish and European law:

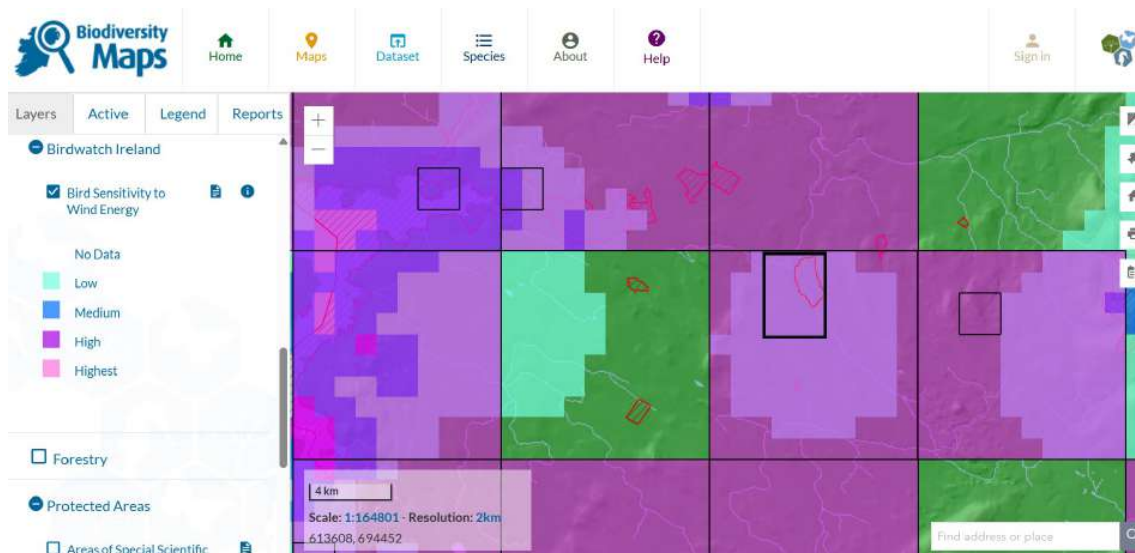
- Protected under the Wildlife Acts 1976-2019 (as amended)
- Protected under Article 5 of the EU Birds Directive (2009/147/EC), which prohibits deliberate killing, disturbance, or destruction of nests and eggs of all wild birds
- Red Listed on the Birds of Conservation Concern Ireland (BoCCI) 2020-2026 list (Gilbert et al., 2021), indicating a species of the highest conservation concern in Ireland

5.1.2 Population Status

The Irish Barn Owl population is critically small. Expert opinion from BirdWatch Ireland and NPWS (2019) estimates only 562 to 702 breeding pairs exist in the entire country. This is one of the smallest national populations of any regularly breeding raptor in Ireland.

West County Offaly has been identified by Lusby et al. (2022) as containing the **highest density of breeding Barn Owls in Ireland**. The 10km Irish Grid square containing the majority of the Ballincor proposed project site (S09) contains at least six confirmed breeding pairs — an exceptional local concentration given the national population size.

For context the map below shows the S09, the black box broadly referencing the Windfarm development area and identifies in the legend on the left as having the 'HIGHEST' Bird sensitivity to Wind Energy.



The map below assesses bird sensitivity to Wind Energy across Ireland and notice the vast tracks of land with No, Low or Medium impact triggering the Coolglass Supreme Court arguments discussed earlier.



The Irish population has undergone both long-term and short-term decline over the past 25 years (Gilbert et al., 2021). Any additional anthropogenic mortality pressure — including that from wind turbine collisions — must be assessed against this baseline.

5.2 Flight Behaviour and the Collision Risk Misconception

5.2.1 The Low-Flight Assumption and Why It Is Wrong

A commonly cited argument in wind farm assessments is that Barn Owls hunt predominantly close to the ground (typically cited as 3-4m), and that because modern turbine blade sweep starts well above this height, collision risk is negligible. This argument is explicitly deployed in the Ballincor EIAR Chapter 7.

This assumption is directly contradicted by authoritative guidance. The CIEEM Barn Owl Survey Methodology (Shawyer, 2012) — the recognised best-practice standard referenced by the applicant's own assessment — states explicitly:

"While [the Barn Owl] typically hunts within a few metres of the ground and is unlikely to encounter the area swept by turbine blades, in reality this bird will fly at considerable height on fixed flight trajectories, when moving from its nest or roost site to outlying feeding habitat or when ferrying prey back to the nest. Potentially, this flight behaviour places barn owls, like many other birds of prey, at significant risk of collision with wind turbines."

Source: Shawyer, C. (2012). Barn Owl Tyto alba Survey Methodology and Techniques for use in Ecological Assessment. CIEEM.

The critical point is the distinction between hunting flight (low, quartering) and commuting/transfer flight (elevated, directional). Any wind turbine situated between a nest site and foraging habitat will be encountered by owls flying at altitude on predictable, fixed routes. Where confirmed nest sites exist within 160m and 600m of proposed turbines, as is the case at Ballincor, commuting flight at rotor height is not merely possible — it is highly probable.

5.2.2 Nocturnal Activity as a Specific Risk Factor

Barn Owl is a predominantly nocturnal species. The standard vantage point (VP) surveys conducted at Ballincor were daytime surveys. The EIAR itself acknowledges this fundamental methodological limitation.

Current peer-reviewed research has specifically identified nocturnal flight activity as a key driver of collision risk. The Barn Owl's silent flight — a key evolutionary adaptation for nocturnal hunting — means it has no auditory cue to avoid turbine blades.

This nocturnal vulnerability was not assessed at Ballincor. No acoustic monitoring, no call logger deployment, and no dusk/dawn transect surveys were conducted. The collision risk assessment for Barn Owl therefore rests on zero species-specific night-time data.

5.3 Peer-Reviewed Evidence: Population-Level Risk

5.3.1 USGS/Oklahoma State University Study (Ecosphere, 2021)

The most authoritative recent peer-reviewed assessment of raptor collision risk from wind turbines was published in the journal *Ecosphere* by the United States Geological Survey (USGS) in collaboration with Oklahoma State University (Diffendorfer et al., 2021). This study examined 14 raptor species and assessed their vulnerability to population-level impacts from wind turbine collisions.

The study found that Barn Owl was identified as one of only five species with the highest potential for population-level impacts from wind turbine collisions. The five high-risk species were: Barn Owl, Ferruginous Hawk, Golden Eagle, American Kestrel, and Red-tailed Hawk.

The study concluded that for these species, additional turbine-caused fatalities could cause population growth rates to go from positive to negative or for already declining species (such as Barn Owl), to become even more negative. The researchers explicitly stated that turbine collisions could contribute to population declines.

USGS specifically highlighted the life-history characteristics of raptors as a key vulnerability factor: raptors live longer than most birds, take longer to reach adulthood, and have fewer offspring. This makes populations more reliant on adult survival, and the impact of turbine-caused adult mortality proportionally greater.

Applied to the Irish context: with only 562–702 breeding pairs nationally, and the Ballincor site located within the highest-density Barn Owl area in Ireland, the loss of even a small number of breeding adults represents a significant and disproportionate impact on the national population.

5.4 Displacement, Disturbance and Territory Abandonment: A Parallel Impact Pathway

The EIAR's assessment of operational impact on Barn Owl is directed almost entirely at collision risk, which it concludes to be negligible. This framing is itself a material deficiency, because collision is not the only, or even the primary, mechanism by which a wind farm of this scale degrades a resident raptor population. Displacement and disturbance operate independently of collision, are not contingent on a single bird ever striking a blade and can drive population-level decline even where collision mortality is low. An assessment that resolves collision risk to "imperceptible" and treats that finding as disposing of operational impact has addressed one pathway while leaving a second, equally consequential pathway substantively unassessed.

Three distinct mechanisms apply at Ballincor:

- **Displacement from established territories.** Barn Owl is a territorial, site-faithful species whose breeding and roosting sites — including the structures recorded at approximately 50m, 160m and 600m from proposed turbines — represent established, multi-year territories. Construction and operational disturbance (habitat loss, noise, lighting, human activity, and the physical presence of turbine infrastructure) can render established territories unviable, displacing breeding adults from sites they would otherwise occupy. The loss of a confirmed or potential nest site to displacement is a permanent reduction in the breeding resource of a nationally important population.
- **Interruption of hunting patterns.** Barn Owl foraging depends on continuous access to open, low-disturbance lowland habitat and on predictable commuting routes between nest and feeding grounds. The introduction of turbine infrastructure across the foraging landscape fragments that habitat and interrupts established hunting patterns, reducing foraging efficiency precisely in the area the EIAR's own incidental records show to be in active use. Reduced foraging efficiency during the breeding season translates directly into reduced provisioning of young and lower breeding success.
- **Long-term avoidance and reduced reproductive success.** The cumulative effect of displacement and disturbance is long-term avoidance of the affected

area, leading over successive seasons to territory abandonment, reduced reproductive success, and local population decline. For a species with the life-history characteristics identified by Diffendorfer et al. (2021) — long-lived, slow to reach maturity, low fecundity, and therefore reliant on sustained adult survival and breeding output — chronic suppression of reproductive success is a population-level impact in its own right, distinct from and additional to any collision mortality.

These mechanisms are not speculative. They are the established basis on which the NPWS/DAU and independent raptor specialists have objected to comparable developments. In her objection to the Garrane Green Energy wind farm (County Limerick), Susan Kerwin, a National Parks and Wildlife Service-licensed raptor rehabilitation specialist and board member of The Barn Owl Project, identified the same three-mechanism displacement pathway, warning that for species reliant on quiet, open lowland for foraging and nesting, the compounded environmental stress of wind farm development can lead to territory abandonment, reduced breeding success, and long-term population decline. That the identical pathway has been independently identified by a licensed specialist at a separate Irish site reinforces, rather than isolates, its application here.

The EIAR engages this pathway only through Table 7-18 (disturbance/displacement), which it resolves to "not significant" on the same evidential foundation that produced the collision-risk conclusion: an assessment conducted without a single nocturnal survey, without confirmed occupancy status for the structures nearest the turbines, and without any established baseline of breeding territories, hunting ranges or commuting routes against which displacement could be measured. A displacement finding of "not significant" is only as reliable as the baseline that underpins it. Where no such baseline exists, the conclusion is not a finding — it is an assumption.

5.5 Survey Methodology: Critical Deficiencies

5.5.1 The NPWS Scoping Requirement

The NPWS Development Application Unit (DAU) explicitly stated in its scoping response that the Ballincor site falls within a BirdWatch Ireland-identified sensitivity zone for Barn Owls, and that detailed and specific surveys on Barn Owls should be completed, with mitigation included if impacts are identified. This was a clear, species-specific regulatory requirement.

5.5.2 Required Survey Standards Not Met

Three authoritative guidance documents set clear minimum standards for Barn Owl survey at wind farm developments. None were met at Ballincor:

Guidance Source	Required Standard	What Was Done at Ballincor
CIEEM / Shawyer (2012) Barn Owl Survey Methodology	Dedicated targeted barn owl surveys extending 1.5km from the wind farm boundary. Surveys must include dusk/dawn watches, nest site checks, and nocturnal assessments.	No dedicated Barn Owl surveys conducted. All records are incidental observations during daytime multidisciplinary surveys. No nocturnal survey of any kind undertaken.
NatureScot Recommended Bird Survey Methods for Onshore Windfarms (SNH, 2017; updated 2024)	Breeding surveys for owl species must extend at least 1km beyond the proposed site boundary, using published owl survey methods. Late evening surveys between May and July are essential to detect calling juveniles and confirm successful	No dedicated owl survey to any distance was conducted. The 1km requirement was not acknowledged or applied. No evening or nocturnal surveys were conducted during the critical June–July juvenile calling period. No systematic search for

Guidance Source	Required Standard	What Was Done at Ballincor
	breeding pairs. Surveys should include documentation of physical evidence such as moulted feathers and pellets.	physical evidence of occupancy was carried out at any point during the six-year survey period.
BirdWatch Ireland / Transport Infrastructure Ireland (2017 & 2021) Barn Owl Survey Methodology — the established Irish standard, used by Lusby et al. (2022) in the County Offaly Barn Owl Survey that identified the nationally important population in the area surrounding this site	All potentially suitable structures must be identified and systematically inspected for signs of Barn Owl occupancy, including pellets, whitewash and moulted feathers. Where sign-searching is inconclusive or where sites are inaccessible, nocturnal surveys must be conducted to confirm presence or absence.	No systematic identification of suitable structures within or around the site was carried out. No structured sign-searching protocol was applied. No nocturnal follow-up surveys were conducted at any location.

5.5.3 What the Incidental Evidence Reveals About Survey Adequacy

The inadequacy of the survey effort is demonstrated not only by what was omitted, but by what was found when even cursory inspections happened to take place. The EIAR's own Appendix 7-1 records the following incidental observations, none of which arose from dedicated Barn Owl survey, but all of which were generated by multidisciplinary field visits that happened to inspect suitable structures near the site boundary:

- On 10 June 2022, an adult Barn Owl was flushed from an old barn in a farmyard 20 metres from the redline boundary. Down feathers were noted. This was recorded during a multidisciplinary survey, not a barn owl survey.
- On 9 July 2025, a building approximately 50 metres from the redline boundary was found to contain fresh whitewash, feathers and pellets — indicators the EIAR's own note describes as "very suitable for breeding," with sections of ceiling missing where a nest could be located. This too was recorded during a multidisciplinary survey.
- On 10 March 2026, evidence of Barn Owl potentially breeding was recorded at two locations: one at approximately 50 metres from the site boundary (feathers, pellets, audio recording of calls from a voice recording device, and calls heard from a nearby dusk VP survey), and a second at approximately 450 metres, where a species-specific nest box in a derelict round tower was reported by the landowner to have held a breeding pair in previous years.
- Additionally, a Barn Owl carcass had been found at the first location in October 2025.

Two conclusions follow from this timeline:

1. Every occasion on which someone inspected a suitable structure near the site boundary produced positive evidence of Barn Owl presence. That evidence was found incidentally, in daylight, without specialist methodology. A dedicated survey which systematically identifies all potentially suitable structures and inspects them for precisely these signs would have almost certainly have generated positive results from the outset of the survey period in 2020. The evidence was always there; it was simply never sought.
2. The NatureScot guidance identifies Owl surveys in the June/July window as the essential window for detecting calling juveniles and confirming whether breeding pairs have been successful. None happened in any year of the six-year survey period means. Without surveys in this period, the EIAR could never have determined whether breeding was occurring, let alone whether it was successful. Breeding success is a prerequisite for any meaningful assessment of population-level impact, and its absence from the evidence base renders the impact assessment structurally incomplete.

5.5.4 The Consequence of Survey Failure

The failure to conduct dedicated Barn Owl surveys has created a self-fulfilling assessment gap. Because no nocturnal surveys were done, no nocturnal flight data exists. Because no nocturnal flight data exists, no collision risk could be modelled. The

applicant then used the absence of modelled collision risk as evidence that collision risk is negligible — a circular and methodologically untenable conclusion.

At a minimum there are baseline parameters required to assess whether additional turbine-caused mortality would have a population-level effect. The USGS/Ecosphere study (Diffendorfer et al., 2021) identifies Barn Owl as among the five raptor species most sensitive to population-level impacts from wind turbine collisions — but applying that finding requires knowing the size and productivity of the local breeding population. At Ballincor, neither was established.

A dead Barn Owl was recorded at a location approximately 50 metres from the site boundary in October 2025. This is direct evidence of owl mortality in the immediate vicinity of the proposed development. The carcass was not examined, the cause of death was not determined, the event was not reported to NPWS, and it did not trigger any reassessment of collision risk or survey requirements in the EIAR.

5.6 Correct Reading of the Barn Owl Trust Position

The applicant cites the Barn Owl Trust Wind Turbine Position Statement (2015) as supporting the conclusion that Barn Owls can breed successfully near turbines with minimal mortality. This citation requires careful qualification.

The Barn Owl Trust statement was produced in 2015 and has not been updated. It predates the USGS Ecosphere study (2021) which specifically identified Barn Owl as a high population-level risk species. The Trust's own online guidance states that without consistent monitoring, mortality may be under-recorded, and that the probability of finding dead birds is reduced by scavenger removal.

Critically, the Barn Owl Trust recommends that new major wind farm developments be surrounded by predator-proof fencing to prevent scavenging of carcasses, positioned at a distance no less than the height of the mast plus the length of one blade. No such infrastructure has been proposed or committed to at Ballincor. Without it, post-construction mortality monitoring will systematically under-record Barn Owl fatalities.

The applicant has therefore selectively cited the Trust's conclusion while ignoring the Trust's own recommended mitigation measures that are preconditions for that conclusion to be valid.

5.7 Internal Contradictions in the Ballincor EIAR Assessment

The Ballincor EIAR contains a fundamental internal contradiction on the Barn Owl issue that is material to the validity of the assessment:

- The EIAR records potential nest sites at 160m and confirmed nest site at 600m from turbines respectively and 8 known nest sites within 5km, noting that west County Offaly contains the highest density of breeding Barn Owls in Ireland (Lusby et al. 2022)
- "The EIAR's narrative assessment (Section 7.4.2.1.1, p.7-67) concludes the local Barn Owl population is of National importance, while Table 7-14 (p.7-84) simultaneously assigns a lower NRA evaluation of County importance — an internal inconsistency that undermines the validity of every impact calculation that follows.
- The EIAR assigns Barn Owl a sensitivity of Medium (Table 7-14, p.7-84), justified in the Rationale column solely by reference to the species' Red List status. However, the same framework — Table 7-6 of Chapter 7 — provides that species present in **nationally** important numbers should attract High sensitivity, not Medium. Having concluded in Section 7.4.2.1.1 that the local population is of National importance, the applicant was required by its own framework to apply High sensitivity throughout the impact matrices. It did not do so. The Medium sensitivity classification is therefore not a neutral finding — it is the point at which the internal contradiction between the narrative assessment and the impact tables first takes effect, and from which every subsequent underestimate of significance flows.
- Despite all of the above, the EIAR concludes that operational impacts are not significant in EIA terms in Table 7-18 (disturbance/displacement) and the collision risk magnitude is **negligible** and the significance **imperceptible**.

This conclusion cannot be upheld. A nationally important population, in the highest-density area in the country, with confirmed breeding within 160m of a turbine, assessed on the basis of zero nocturnal survey data, cannot rationally be concluded to face impacts that are not significant/negligible/imperceptible. The conclusion is unsupported by the evidence base the applicant itself presents.

5.8 Adequacy of Mitigation and Monitoring

The sole Barn Owl mitigation provision in the EIAR is Mitigation Measure MM90 (Chapter 20, p.20-54), which states in its entirety: *"A precautionary approach will be maintained. If unexpected ornithological issues arise during the operational phase, such as evidence of collision risk to sensitive species, an adaptive management strategy will be implemented."*

For the construction phase, Table 7-22 (p.7-168) records the Mitigation Measures column for Barn Owl as *"No Mitigation Required"*, noting only that seasonal restrictions on site clearance and the appointment of an Ecological Clerk of Works will incidentally reduce impact magnitude.

No nest site protection buffer is proposed around the barn 50 metres from the site boundary. No pre-construction nocturnal verification of occupancy is required. No predator-proof fencing is proposed at any turbine. No Barn Owl-specific carcass search protocol is included in the Bird Monitoring Programme. The word "owl" does not appear in Appendix 7-3. There is no defined mortality threshold, no species-specific curtailment trigger, and no NPWS reporting obligation tied to Barn Owl fatalities. MM90 names no species, identifies no trigger condition, and specifies no measurable adaptive management response.

Even if MM90 were considered adequate in principle, it cannot function in practice, because the baseline survey against which it is supposed to operate does not exist. Adaptive management of any credibility requires a known pre-construction baseline — established occupancy data, documented flight lines, confirmed breeding status — against which post-construction observations can be compared to identify whether effects are materially exceeding predictions. At Ballincor, no such baseline was generated.

The applicant acknowledges in Table 7-21 that VP surveys are incapable of detecting a nocturnal species, no nocturnal flight data was produced, and the occupancy status of

the barn 160 metres from a turbine was never resolved. The predicted Barn Owl collision risk is therefore Imperceptible — effectively zero — and MM90's trigger phrase, *"if unexpected ornithological issues arise"*, sets a threshold that can only be crossed if the post-construction monitoring programme detects a fatality. That monitoring programme consists of daytime surveys and interval dog searches without predator-proof fencing, in conditions where the Barn Owl Trust itself warns that carcass removal by scavengers will systematically undercount mortality. The adaptive management mechanism is therefore contingent on detecting events that the monitoring programme is structurally incapable of reliably detecting. A mitigation measure that can only be activated by evidence it has no reliable means of generating is not a mitigation measure. It is the absence of one.

5.9 Summary of Key Objection Points

The site lies within the highest-density Barn Owl area ever documented in Ireland, with a nationally important population, confirmed breeding activity 160 metres from a proposed turbine, and a pre-construction mortality event at the site boundary. The assessment was conducted without a single nocturnal survey, relies on a decade-old charity position paper while ignoring contrary peer-reviewed science, contains an irreconcilable internal contradiction between its narrative and its impact matrices, and proposes mitigation that cannot function in the absence of the baseline data that should have been generated before this application was submitted..

The objection is advanced on six grounds.

Ground 1 — Failure to comply with NPWS scoping requirement. The NPWS/DAU explicitly required detailed and specific Barn Owl surveys as a condition of the scoping process. None were conducted; the applicant substituted desk study and third-party consultation, which do not satisfy the regulatory requirement.

Ground 2 — Structurally inadequate survey methodology. The applicant's own EIAR acknowledges that daytime VP surveys are incapable of detecting a predominantly nocturnal species, yet no nocturnal surveys, acoustic monitoring or dusk/dawn transects were conducted across a six-year survey period. The absence of data this produced was then used to conclude negligible collision risk — a circular argument that is methodologically untenable.

Ground 3 — No survey in the critical June/July window. Absence of survey deems it impossible to detect calling juveniles and confirming whether breeding pairs have been successful. Breeding success is a prerequisite for any meaningful assessment of population-level impact, and its absence from the evidence base renders the impact assessment structurally incomplete.

Ground 4 — Collision risk assessment relies on incomplete and superseded evidence.

The EIAR's dismissal of Barn Owl collision risk rests almost entirely on hunting flight height — the 3–4m figure drawn from a 2015 charity position paper (Barn Owl Trust, 2015) — set against the 17m lowest blade sweep. In doing so it ignores the CIEEM best-practice guidance (Shawyer, 2012), which identifies elevated commuting flight between nest and foraging habitat, not low hunting flight, as the primary collision risk vector; and the peer-reviewed USGS/Ecosphere study (Diffendorfer et al., 2021), which identifies Barn Owl as among the five raptor species with the highest potential for population-level impacts from turbine collisions. A non-peer-reviewed source is relied upon for a single behavioural figure while the published guidance addressing the actual risk pathway is omitted..

Ground 5 — Internal contradiction between National importance finding and "not significant" conclusion. The EIAR's own narrative concludes the local Barn Owl population is of National importance yet the impact matrices apply County importance and Medium sensitivity throughout, producing conclusions of not significant and imperceptible that the applicant's own framework cannot sustain from a National importance starting point.

Ground 6 — Mitigation and monitoring incapable of detecting or responding to impacts. MM90, the sole operational ornithology mitigation measure, names no species, sets no trigger threshold and specifies no adaptive management response; the Bird Monitoring Programme contains no Barn Owl content; and post-construction fatality monitoring relies on daytime dog searches without predator-proof fencing, meaning the adaptive management mechanism is contingent on detecting events the monitoring programme is structurally incapable of reliably generating.

5.10 Key References

Diffendorfer, J.E. et al. (2021). Demographic and Potential Biological Removal Models Identify Raptor Species Sensitive to Current and Future Wind Energy. Ecosphere, USGS/Oklahoma State University.

Gilbert, G. et al. (2021). Birds of Conservation Concern Ireland 2020-2026 (BoCCI). BirdWatch Ireland / NPWS.

Lusby, J. et al. (2022). Barn Owl Survey of County Offaly. BirdWatch Ireland.

NatureScot (2017, updated 2024). Recommended Bird Survey Methods to Inform Impact Assessment of Onshore Wind Farms. Scottish Natural Heritage Research Report 909.

NPWS/DAU (2024). Scoping Response to RWE/Ballincor Wind Farm Application. Department of Housing, Local Government and Heritage.

Shawyer, C. (2012). Barn Owl *Tyto alba* Survey Methodology and Techniques for use in Ecological Assessment. CIEEM, Winchester.

Barn Owl Trust (2015). Wind Turbine Position Statement. Barn Owl Trust, Ashburton, Devon. [Note: pre-dates USGS 2021 findings; should not be relied upon as current best-practice evidence.]

BirdWatch Ireland / NPWS (2019). Expert Opinion on Irish Barn Owl Population Estimate. Cited in Ballincor EIAR Chapter 7.

APPENDIX 10: Equine

Chapter 11: Equine

11.0 Introduction

This report addresses the impact of the proposed Ballincor Wind Farm on three equine breeding enterprises located within close proximity to the proposed turbine array. It examines how the developer's Environmental Impact Assessment Report (EIAR) treated these enterprises, identifies the critical gaps in that assessment and draws on peer-reviewed scientific literature, planning precedent, and official equine welfare guidance to demonstrate why the proposed development poses unacceptable risks to these operations.

Grounds for Objection / Principal Failures

- **Ground 1** — The EIAR is materially incomplete and legally inadequate in its treatment of equine receptors.
- **Ground 2** — The proposed development poses an unacceptable, unassessed risk to equine welfare, breeding viability, and human safety, supported by peer-reviewed evidence.
- **Ground 3** — The application is contrary to established planning precedent and the precautionary principle, and is unsupported against industry concern.

Wraymount Stud is a family-run Thoroughbred breeding farm located in Sharavogue, Birr, County Offaly. Owned and operated by bloodstock expert Patrick Headon, the stud is highly regarded in the Irish horse racing and breeding industry for successfully producing resilient, black-type racehorses. Wraymount Stud is not a purely domestic enterprise. It keeps and manages horses for owners from around the world, including the Middle East, placing it within a network of international bloodstock investment where confidence in the quality of the local environment is a commercial prerequisite. Wraymount Stud paddocks extend down to the callows of the River Brosna where all paddocks will lie under 1 km from the nearest proposed turbine. The closest paddock will be 300m from T8. The property is listed as Receptor 162 in RWE's shadow flicker assessment.



Images of Wraymount Stud and paddocks and proximity to Turbines above and below.



Hazel Perdue is a breeder of Irish Draught horses located approximately 1.1km from the proposed development. The Irish Draught is Ireland's first traditional working horse and a native horse breed, classified by the United Nations Food and Agriculture Organisation as endangered. The breeding tradition itself is listed on Ireland's National Inventory of Intangible Cultural Heritage, maintained by the Department of Housing, Local Government and Heritage. Fewer than 1,000 purebred foals are registered in the entire country each year. The breed survives only through the active conservation effort of breeders such as Ms Perdue, supported

by Horse Sport Ireland, the Irish Draught Horse Society of Ireland, the Royal Dublin Society, and the Irish Cattle Breeding Federation.

Michael Hunt breeds Thoroughbreds at Orchard House, Ballinamoe, Shinrone, with stables attached to the family home and broodmares, foals and yearlings cycling through the premises in every season. He is an Irish Master Farrier, American Certified Farrier and European Certified Farrier with more than twenty-five years' professional experience across multiple jurisdictions working with horses of every breed and temperament. His property is listed as Receptor 53 (H053) in RWE's assessment. The nearest of the proposed turbines, T6, stands 854 metres from the house, with three further turbines, T5, T7 and T4, falling within the shadow flicker study area. RWE's own model records 73 hours and 33 minutes of shadow flicker per year at the property across 144 days, one of the highest exposures of any receptor on the site, yet the stables and paddocks where his horses live were never modelled as equine receptor points.

While this report focuses primarily on the thoroughbred dimension, where the scientific evidence base is strongest and the economic stakes most quantifiable, the risks to Ms Perdue's Irish Draught breeding programme and animals are no less real and significant.

11.2 Context: Ireland's Equine Industry and the Area

11.2.1 National Significance

Ireland is the third largest producer of thoroughbred foals in the world, behind only the United States and Australia, and exceeds the combined totals of the United Kingdom and France. According to the 2017 Deloitte Economic Impact Study commissioned by Horse Racing Ireland, the Irish breeding and racing industry generates €1.84 billion in total direct and stimulated expenditure and sustains approximately 28,900 jobs across Ireland (Deloitte, 2017). On a per capita basis, Ireland has approximately 50 thoroughbred horses per 10,000 people — a figure that is several multiples higher than any other major racing nation and ten times greater than Great Britain.

The industry operates across all 32 counties, with particular concentration in rural areas that have limited alternative employment opportunities. Horseracing is deeply rooted in national heritage and rural identity, and Ireland's continued viability as a world-leading equine centre depends on protecting the environmental conditions under which horses are bred, reared, and trained.

11.2.2 Wraymount Stud

Wraymount Stud is a thoroughbred breeding operation of established reputation, situated on historically significant lands. The property includes Wraymount House, recorded on the 1838 Ordnance Survey map with a long tree-lined avenue, and the Raymount Demesne, identified in the Ch 13 EIAR as a designed landscape. The stud maintains broodmares, manages paddocks, exercise arenas, and schooling areas, and operates a breeding programme that contributes to Ireland's bloodstock output.

The principal paddock of the stud farm sits at approximately 975 metres from turbine T09, a second paddock sits just 300 metres from turbine T08. Two further turbines, T07 at 1,585 metres and T10 at 1,629 metres, also fall within the shadow flicker study boundary from that paddock. RWE's own EIAR named Wraymount Stud in two separate chapters, Ch2 and Ch5. This is not a business that was unknown to the developer.

11.2.3 Hazel Perdue — Irish Draught Breeding

Ms Perdue's Irish Draught horse breeding enterprise lies approximately 1,100 metres from the nearest proposed turbine. Her operation continues a family tradition of breeding Ireland's first native horse breed. The scale of the conservation challenge cannot be overstated: fewer than 1,000 purebred foals are registered annually across the entire country. Every active breeder is a participant in a nationally and internationally recognised conservation effort. Any disruption to her operation is not merely a private economic loss; it is a measurable setback to an endangered breed conservation programme recognised by the State (Department of Housing, Local Government and Heritage).

Despite this, RWE's EIAR contains no reference whatsoever to Ms Perdue's enterprise. Her horses, her breeding programme, and her intangible cultural heritage contribution are entirely absent from the developer's assessment.

11.2.3 Michael Hunt

This local Thoroughbred breeding operation is run from Orchard House, Ballinamoe, Shinrone, where stables are attached to the family home and broodmares, foals and yearlings are kept on the premises throughout the year. Michael Hunt's holding is classified as a *residential* receptor (R53) and is also one of the highest shadow-flicker exposures on the entire site (73h33m/year), with a confirmed night-time noise exceedance. His holding was named as a residence, assessed as a building, never as a stud..

11.3. How the Developer Treated These Enterprises

11.3.1 Wraymount Stud: Named and Then Ignored

RWE's EIAR acknowledged Wraymount Stud by name in two separate chapters. Chapter 2, the project description chapter, states: 'Some equestrian activity is noted in the surrounding area. Wraymount Stud is located approximately 1.4 km north east of the proposed wind farm site.' Chapter 5 names it again among the amenities and services nearest to the proposed wind farm site. Despite this double acknowledgement, no equine-specific assessment was carried out in any chapter of the EIAR:

- Shadow Flicker:** Wraymount Stud is listed as Receptor 162 in the shadow flicker assessment and described simply as a 'sensitive receptor' — the same generic category applied to every dwelling in the study area. The assessment point was placed at the building coordinates, not at the paddocks where horses are kept. The principal paddock, at approximately ITM E 605,534, N 697,927, is around 502 metres west-southwest of where RWE placed their model point. From the building, only two turbines fall within the study boundary. From the paddock, four do. No paddock, exercise arena, or schooling area was modelled. No equine receptor points were entered. No equine welfare threshold was applied.
- Noise:** The noise assessment was designed and calibrated entirely for human residential receptors. Wraymount Stud falls within the 35 to 40 dB(A) noise zone at rated wind speed. Whether this is acceptable for horses, animals that detect low-frequency vibration through their hooves and teeth as well as through hearing (Sankey et al., 2023) was never asked.
- Heritage:** Chapter 13 identified two heritage assets associated with the property and found that all will experience moderate indirect negative effects. Wraymount House (CH8) and Raymount Demesne (DL49) were assessed by desktop analysis, ZTV mapping, and photomontages — without a site visit. Eleven turbines at 180 metres tip height, at 1.36 kilometres from this property, will dominate the visual character of this demesne for 35 years.
- RWE named this stud farm. They knew what it was. They then prepared every chapter of the EIAR as if it were a residential dwelling. The failure to carry out a site-specific equine assessment was not an oversight. It was a choice.

11.3.2 Hazel Perdue and Michael Hunt: Not Even Mentioned

Ms Perdue's Irish Draught horse breeding enterprise does not appear anywhere in the EIAR. It is not named. It is not described. It is not assessed. No reference is made to the presence of an endangered native breed within 1,100 metres of the proposed turbines. No reference is made to the intangible cultural heritage dimension of her breeding practice. No shadow flicker, noise, or heritage assessment addresses her horses or her operation in any way. This is a complete omission of a receptor of national conservation significance. An adequate Environmental Impact Assessment cannot claim to have assessed the impact of a development on the surrounding area when an enterprise breeding an FAO-classified endangered breed within 1,100 metres of the turbine array has been entirely excluded.

Michael Hunt's holding is classified as a *residential* receptor (R53) and despite the recorded noise and shadow flicker impact in the Applicants document with a confirmed night-time noise exceedance, his holding was never assessed for equine activity.

11.4 Impact of Wind Turbines on Horses and Breeding Operations

11.4.1 The Equine Visual System and Shadow Flicker

The horse possesses the largest eyes of any land mammal relative to skull size, positioned laterally to provide a visual field of approximately 350 degrees (Evans & McGreevy, 2006; Iowa State University Extension, n.d.; Olsson et al., 2025). The retina has a rod-to-cone ratio of approximately 20:1, heavily optimised for motion detection rather than colour or fine detail. This architecture evolved specifically for detecting predator approach from any angle, and it means a horse can see a rotating turbine blade virtually anywhere in its surroundings without turning its head (Knickelbein, 2022).

Shadow flicker from a wind turbine is precisely the type of stimulus this system is calibrated to detect. It is intermittent, not constant; moving across the visual field; occurring in peripheral vision for horses grazing in a field; and rhythmic and repetitive. The neural pathway from peripheral motion detection to adrenal arousal in the horse is extremely short — faster than conscious processing. A horse does not evaluate whether a flickering shadow is dangerous. It reacts first (Olsson et al., 2025).

The British Horse Society, the most authoritative equestrian body in the UK and Ireland, explicitly identifies shadow flicker as a horse-spooking hazard in its published guidance on wind turbines (BHS, 2025). Shadow flicker can extend up to 1.0–1.5 km under certain solar geometry conditions. All enterprises fall within this range, their paddocks even more so.

11.4.2 Thoroughbred-Specific Stress Physiology

The Thoroughbred horse is the product of over 300 years of selective breeding for athletic performance traits — primarily speed, cardiovascular output, and reactive agility. These traits have a well-documented consequence: elevated HPA-axis (hypothalamic-pituitary-adrenal) reactivity compared to calmer breeds (Noschenko & Masko, 2022).

A peer-reviewed study of 149 sport horses (PMC6886778) found that Thoroughbreds showed significantly higher cortisol stress responses than other breeds after stimulation testing (Zubrod et al., 2019). This is not anecdotal observation; it is peer-reviewed neuroendocrine evidence that the breed kept at Wraymount Stud is demonstrably more stress-reactive at a physiological level than calmer breeds. Sustained cortisol elevation in mares has been associated with impaired conception rates and early embryonic loss. For a stud farm, this is not just a welfare concern. It is a direct commercial and reproductive risk.

11.4.3 Shadow Flicker Exposure at Wraymount Stud

RWE's figures for Receptor 162 show an annual shadow flicker total of 9 hours and 20 minutes, occurring across 48 days per year, with a maximum daily duration of 21 minutes. On the basis of these figures, RWE treats this property as fully compliant with the 30/30 standard (30 hours per year, 30 minutes per day).

However, this assessment is fundamentally inadequate for a stud farm:

- **The assessment point was at the building, not the paddock.** The principal paddock is approximately 502 metres west-southwest of Receptor 162. From the paddock, four turbines fall within the study boundary — T07, T08, T09, and T10. None were modelled as casting shadow onto this paddock.

- **Cumulative daily exposure is approximately 110 minutes.** This comprises 23 minutes from T10, 38 minutes from T09, and a compound window of 49 minutes from T07 and T08 together, whose shadow windows overlap within the same afternoon period. During that 49-minute compound window, the paddock receives shadow from two turbines in close succession in an arrhythmic pattern
- **The 30/30 thresholds are designed for humans in buildings.** They were developed in Germany in the 1990s for residential amenity and have no relationship to equine welfare, equine physiology, or the specific vulnerabilities of thoroughbred horses.
- **No shutdown system protects any paddock.** Because no paddock was entered as a receptor point, no automatic turbine shutdown has been configured for any equine area on this farm.

11.4.4 Noise and Vibration

Horses are significantly more sensitive to sound than humans. Their hearing range extends to frequencies above 33 kHz, compared to under 20 kHz for humans, and they detect low-frequency vibration through their hooves and teeth during grazing as well as through hearing. Wind turbines generate both audible broadband noise and low-frequency ground vibration — both of which horses may register through multiple sensory channels simultaneously (Sankey et al., 2023).

Research confirms that unpredictable noise causes the greatest fear reactions in horses. More than 84% of horses show immediate avoidance or attempts to flee after perceived threats. A UK/US owner survey study found that in very anxious horses, noise reactivity did not improve over time in 49% of cases and worsened in 15% (Gianoli et al., 2022). The assumption that horses near turbines will 'get used to it' is not supported for the subset of horses with higher baseline anxiety — a subset disproportionately represented in the Thoroughbred breed.

Pregnant mares exhibit heightened sensitivity to noise and light fluctuations, which may interfere with gestation and increase the risk of premature birth or behavioural distress. Foals exposed to elevated noise levels during early development show signs of sleep disruption, increased startle responses, and reduced social bonding behaviours. For Wraymount Stud's Thoroughbreds, Ms Perdue's Irish Draughts and Michael Hunts Thoroughbreds, these are serious welfare and breeding viability concerns.

11.4.5 Rider and Handler Safety

This dimension has no equivalent in assessments of turbine impacts on other livestock. A spooking dairy cow is a welfare concern; a spooking thoroughbred with a rider or handler is a potential human fatality.

The BHS guidance notes that horses are flight animals whose instinct is to run from perceived danger, and that some horses may instantly flee (BHS, 2025). Shadow flicker presents a particularly insidious safety risk because it is intermittent and unpredictable from the horse's perspective; it operates in peripheral vision where the horse is most likely to trigger a reflex flight response; and it may occur in areas that a rider believes to be familiar and safe because it varies with season and time of day. A horse that has safely passed a turbine location 50 times without incident may encounter shadow flicker for the first time on the 51st occasion.

Under the Safety, Health and Welfare at Work Act 2005, an employer has a duty to identify and manage risks in the workplace. Shadow flicker causing a horse to bolt, rear, or spin without warning during mounted exercise or routine handling is a foreseeable workplace hazard. It has not been assessed, managed, or mentioned anywhere in RWE's submission.

11.4.6 Non-Habituation

A critical point for all operations is that shadow flicker cannot be systematically desensitised in the conventional sense. It is intermittent and variable — it changes with season, time of day, and wind direction. Unlike a static object that a horse encounters repeatedly at the same location, a horse may pass the turbine site calmly on dozens of occasions and encounter shadow flicker unexpectedly for the first time weeks or months later (BHS, 2025; Janicka et al., 2024).

Furthermore, stud farm operations involve a continuous throughput of animals. Visiting mares arrive for covering and remain for short periods. Newborn foals have no prior habituation to any environmental stimuli. Young horses in breaking and pre-training face the same exposure afresh. Horses returning from the southern hemisphere for each breeding season encounter conditions anew. There is no opportunity for systematic acclimatisation (ITBA & IRTA, 2020).

11.4.7 Specific Risks to Irish Draught Horses

While much of the scientific literature focuses on thoroughbreds, the Irish Draught is not immune to the effects described above. All horses share the prey-animal visual architecture,

the flight response mechanism, and sensitivity to noise and vibration. Irish Draughts, though generally calmer in temperament than thoroughbreds, are still flight animals with the same basic neurological responses to moving shadows and unpredictable noise (Evans & McGreevy, 2006; Olsson et al., 2025).

The critical additional factor for Ms Perdue's operation is the conservation dimension. With fewer than 1,000 purebred foals registered annually, every breeding mare, every successful foaling, and every healthy foal matters to the survival of the breed. Any disruption to reproductive outcomes — whether through stress-induced early embryonic loss, foal injury from flight responses, or behavioural disturbance during the critical neonatal bonding period — has consequences that extend beyond one farm to the national and international conservation effort for Ireland's first native horse breed.

11.5 Planning Precedent

The principle that industrial-scale development must demonstrate compatibility with established equine operations has been upheld in both Irish and UK planning decisions.

11.5.1 An Bord Pleanála — Castleblake, Rosegreen, Co. Tipperary

In ABP Reference PL23.225138, the Board refused planning permission for an industrial facility adjacent to a major thoroughbred operation, finding that it would be incompatible with equine related activities in the vicinity and would be prejudicial to the viability of the equine industry in that area. The Planning Inspector invoked the precautionary principle, stating that the business in question carries Ireland's reputation in the bloodstock industry worldwide and that the onus is on any new development in the rural area, and in particular non-agricultural development, to demonstrate that it will not have a negative impact on the viability of existing stud farms or stables (ABP PL23.225138).

11.5.2 UK Secretary of State — Equine Businesses Refusal

In Planning Appeal Reference APP/H0928/A/09/2093576, the UK Secretary of State for Communities and Local Government refused permission for a proposed development of 9 wind turbines, acknowledging that the development would have a potential significant adverse impact on three nearby equine businesses and that considerable weight should be attached to this. The Planning Inspector noted three particular aspects of wind turbines that have a very significant detrimental effect on horses and riders: blade movement, shadow flicker, and noise at start-up. The Inspector acknowledged that thoroughbred horses are high

value, highly strung and volatile and concluded that the risks would exist over and above the normal risks these stables experience.

11.5.3 The Precautionary Principle

The EU's specialist animal welfare body for equines, EURCAW, confirmed in its 2024 review that direct scientific research on shadow flicker and horses is essentially absent (EURCAW, 2024). That absence of research does not mean the risk is absent, it means it has not been studied. In the context of an EIA for a development that will operate for 25 to 30 years next to a working stud farm, the appropriate response to acknowledged scientific uncertainty is the precautionary principle, not the assumption that human residential thresholds adequately protect horses.

11.6. Industry Support

The concerns raised in this report are supported by other formal ACP submissions from national and international industry bodies. The Association of Irish Racecourses, representing all 26 licensed racecourses in Ireland, has submitted a formal objection to another Windfarm development in Ballinla Co. Offaly, stating its strong concern regarding the potential implications for the wider horse racing and breeding industries. See Appendix 11-1. The Association highlighted the current decline in Ireland's foal crop and emphasised that any disruption to animal health or behaviour arising from industrial-scale wind energy developments in key breeding regions could have a serious knock-on effect on the entire horse racing and bloodstock ecosystem.

The Irish Thoroughbred Breeders' Association and Irish Racehorse Trainers' Association have jointly submitted formal positions to the WEDG (Wind Energy Development Guidelines) Review, making clear that the thoroughbred industry is unusually sensitive to perceptions of landscape quality and operational environment (ITBA & IRTA, 2020). International investors, overseas owners, and clients of elite bloodstock operations expect a rural setting characterised by undisturbed pasture, open skylines, and high-quality land management. This is not aesthetic preference — it is a commercial requirement underpinning a €1.84 billion national industry (Deloitte, 2017).

11.7 Conclusion

The evidence assembled in this report demonstrates the following:

- 1.** RWE identified Wraymount Stud by name in its EIAR and then failed to carry out any equine-specific assessment of shadow flicker, noise, or heritage impacts. The shadow flicker assessment modelled the building, not the paddocks. The noise assessment applied human thresholds without equine adjustment. The heritage assessment reached a moderate negative effect finding without visiting the property.
- 2.** RWE entirely omitted Ms Perdue's Irish Draught horse breeding enterprise and Michael Hunt's equine enterprise from the EIAR, despite their proximity to the site, the high risks of shadow flicker and the recorded noise levels and exceedances.
- 3.** The peer-reviewed scientific evidence demonstrates that horses — and thoroughbreds in particular — are disproportionately sensitive to shadow flicker, noise, and vibration. The equine visual system is specifically adapted to detect moving shadows as predator-approach signals. Thoroughbreds show statistically higher cortisol stress responses than calmer breeds. Sustained cortisol elevation in mares is associated with reproductive impairment.
- 4.** The cumulative unmodelled shadow flicker exposure at Wraymount Stud's principal paddock from four turbines is approximately 110 minutes per day under worst-case conditions, in a compound and arrhythmic pattern. No shutdown system has been configured for any equine receptor point on this property.
- 5.** Rider and handler safety near turbines is a recognised and unmitigated risk, acknowledged by the British Horse Society and upheld in UK planning decisions.
- 6.** Planning precedent in both Ireland and the United Kingdom supports the refusal of developments that are incompatible with established equine operations, and the application of the precautionary principle to protect bloodstock businesses of national significance.

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Appendix: 11 Impact on Material Assets

CHAPTER 12: Impact on Material Assets

12.1 Introduction and Scope

Material Assets is a defined topic under the Environmental Impact Assessment Directive (Directive 2011/92/EU as amended by Directive 2014/52/EU) and is required to be addressed in any Environmental Impact Assessment Report submitted in support of a development of this scale. As confirmed by the Environmental Protection Agency's 2022 Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, Material Assets includes built services and infrastructure, economic assets, and assets of strategic, scientific, educational or cultural value to the receiving community.

The proposed Ballincor Wind Farm would be constructed in a landscape that supports four Material Assets of exceptional and in two cases, internationally significant value:

- **Birr Aerodrome (ICAO: EIBR)** — a licensed aviation facility and Designated Training Organisation operated by Ormand Flying Club for over fifty years;
- **The emergency and rotary-wing aviation corridor** crossing the western Slieve Bloom mountains, on which Coast Guard, Air Corps and Helicopter Emergency Medical Service operations depend in poor weather;
- **I-LOFAR (Irish Low Frequency Array)** — the Irish station of the European LOFAR radio telescope network and Ireland's premier radio astronomy facility, located at Birr Castle Demesne; and
- **Birr Outdoor Education and Training Centre (Birr OETC)** — a State-affiliated residential outdoor education facility operating under the Laois and Offaly Education and Training Board.

This chapter consolidates the impacts on each, demonstrates the cumulative effect on the Material Assets of the receiving environment, and identifies a clear failure in the applicant's Environmental Impact Assessment Report to properly characterise these assets or to consult their operators. On that basis the Group respectfully requests that An Coimisiún Pleanála refuse permission for the proposed development.

12.2 Birr Aerodrome (EIBR) — Licensed Aviation Infrastructure

12.2.1 Status and Function

Birr Aerodrome, identified internationally by ICAO designator EIBR, is a licensed civil aerodrome operated by Ormand Flying Club from a site approximately one nautical mile (1.9 km) south of Birr town. The aerodrome has operated for over fifty years and is widely recognised as the oldest grass-runway flying club in Ireland. It is licensed by the Irish Aviation Authority (IAA) and holds Designated Training Organisation status conferred by the IAA, delivering Private Pilot Licence training to standards prescribed by the European Union Aviation Safety Agency (EASA).

Key operational characteristics are as follows:

- A single grass runway oriented north–south, designated 18/36, approximately 585 metres in length;
- Aerodrome elevation of approximately 250 feet above mean sea level;
- Operations conducted under Visual Flight Rules only, within Class G uncontrolled airspace, with no radar service and no air traffic control — the standard model for Irish general aviation training aerodromes;
- Location within designated Military Operating Area MOA5;
- AVGAS and MOGAS fuel facilities available, making the aerodrome a routine transit point for general aviation traffic across the Irish midlands;
- A confirmed partnership with a skydiving operator, with parachute operations commencing in Summer 2026.

The aerodrome also serves as an occasional base for helicopter emergency and rescue operations responding to tasks in the local area and hosts the Annual Birr Vintage Week Airshow and the Annual Breakfast Fly-In. The latter has raised in excess of €15,000 annually for the Birr branch of the Society of St Vincent de Paul. Educational visits by school groups and Scouting organisations are a regular feature of its programme.

12.2.2 Direct Conflict with the Proposed Turbines

Recent engagement with The Ormand Flying Club identifies a series of safety-critical interactions between the proposed turbines and standard aerodrome operations. The most material of these are summarised below; the full technical analysis is set out in a separate submission presented by Ormand Flying Club and is adopted in full by reference here:

- **Proximity.** Proposed Turbine 1 is located at a distance of approximately 3.8 km (2 nautical miles) from the aerodrome. Turbines 2 and 4 are assessed by the operator as directly overlapping the established training and traffic circuit area. The applicant's assertion at the May 7th 2025 pre-application meeting with An Coimisiún Pleanála that Birr Aerodrome lies "outside the zone of influence" of the development is factually incorrect.
- **Obstacle clearance against circuit altitude.** Training circuit flying at Birr Aerodrome is conducted at the standard 800 feet above ground level. Rule SERA.5005(f) of the Standardised European Rules of the Air requires a minimum clearance of 500 feet above any obstacle overflown. Turbines of approximately 180 metres tip height equate to approximately 590 feet. Maintaining the required clearance would demand circuit altitudes in excess of 1,090 feet above ground level in the affected sector — a height that is not operationally compatible with the standard training circuit at Birr Aerodrome. The circuit cannot simply be 'moved'; it is fixed by runway orientation, prevailing wind, and traffic pattern geometry.
- **Student pilot altitude tolerance.** A student pilot in early training may routinely deviate from assigned circuit altitude by plus or minus 200 feet. This is not negligence — it is the expected variation through which the skill of altitude-holding is acquired. In consequence, an aircraft intending to fly at 800 feet may at a given moment be at 600 feet, leaving only tens of feet of clearance above a 590-foot turbine tip. This is a foreseeable scenario arising in the normal course of training and would be made permanent and recurrent by the proposed development.
- **Prevailing wind and approach geometry.** Runway 18/36 is aligned with the prevailing westerly and north-westerly winds typical of this part of the midlands. Under these conditions the active base and final approach legs of the circuit are oriented to bring aircraft over or in close proximity to the proposed turbine cluster. The conflict between

circuit traffic and the turbines would not be an occasional or exceptional event but a routine feature of operations under the most common meteorological conditions.

- **Visual navigation and loss of the River Brosna reference corridor.** General aviation training at uncontrolled aerodromes is fundamentally dependent on Visual Flight Rules and visual navigation using clear ground features. The River Brosna corridor serves as a primary visual reference line for local training flights operating to and from Birr Aerodrome. The introduction of multiple 180-metre rotating structures into this corridor would compromise the clarity of the river as a navigation reference, introduce dominant vertical elements that compete with the underlying landscape, and increase pilot workload — in particular for student pilots still developing situational awareness.
- **Mechanical turbulence and wake.** Under moderate to strong wind conditions, the turbulent wake of turbines of this scale can persist for several rotor diameters — potentially several hundred metres — at altitudes consistent with light-aircraft training flight. This is a recognised hazard in aviation guidance, including the UK Civil Aviation Authority's CAP 764 and the European Union Aviation Safety Agency's 2020 report on the safety impact of wind turbines in the vicinity of aerodromes and air routes.
- **Uncontrolled airspace and absence of safety net.** Pilots operating at EIBR are responsible for their own separation from terrain, obstacles and other aircraft using visual reference alone. There is no radar controller available to alert a pilot to an emerging conflict. Introducing dominant obstacles into routinely used training airspace removes margin that, in a controlled environment, might be recoverable; at an uncontrolled aerodrome, it is not.
- **Aviation obstruction lighting and low-sun operations.** Flights at EIBR routinely occur in low-sun conditions of early morning and evening, when glare and reduced contrast already affect a pilot's ability to identify and judge distance to obstacles. The mandatory aviation warning lighting on turbines of this height would introduce multiple flashing red obstruction lights into airspace that is presently free of tall lit structures, with consequent visual confusion at the edges of the operating day.

12.2.3 Failure of Consultation

Ormand Flying Club's submission documents that, notwithstanding express direction from both An Coimisiún Pleanála (at the pre-application meeting of February 22nd

2024) and the Irish Aviation Authority that the applicant should engage directly with the operator of Birr Aerodrome, no direct, documented or substantive consultation was undertaken. The only correspondence received by officers of the club, dated February 14th and March 19th 2025, was sent under a subject line referencing "Arbourhill, Tipperary Windfarm Proposal" — a different development at a different location. This was, in any event, not followed up by telephone call, site visit or in-person meeting. This is a material deficiency in the application's treatment of a Material Asset whose operational safety is directly affected by the proposal.

12.3 Emergency and Rotary-Wing Aviation Corridor

12.3.1 A Concentrating Pattern of Development

Over the past five years the Birr area of County Offaly has seen a marked intensification of wind farm development. Consent has already been granted for a development in the Carrig area, with further installations at Derrinlough, Cush, Meenwaun and Cloghan. The present application proposes a further eleven turbines of approximately 185 metres in the Brosna Valley. The cumulative effect is a clustering of large-scale turbines across a single corridor of midlands airspace.



12.3.2 Established Flight Paths Through the Corridor

That corridor is not empty airspace. It lies within established routes used by emergency services helicopters transiting between Dublin and Shannon Airport, and within airspace routinely used by local aviation — including traffic associated with Birr Aerodrome and general leisure and recreational flying across the region.

The operational significance of this clustering has been assessed with the assistance of a retired captain of the Irish Coast Guard (IRCG) rescue helicopter service. That assessment identifies significant concerns not only for IRCG aircraft but for military (Irish Air Corps) helicopters and for civilian aircraft on Air Ambulance or Helicopter Emergency Medical Service (HEMS) missions. The clustering of large turbine developments in this area presents considerable challenges for emergency aircraft logistics. Their proximity to the Slieve Bloom and Kinnitty uplands further restricts the flight paths available, particularly in adverse conditions.

12.3.3 Loss of Viable Flight Corridors in Poor Weather

These constraints are most acute in conditions of low cloud, when safe navigation options are already limited and the available flight corridors are correspondingly reduced. A typical case illustrates the difficulty. A helicopter routing from Shannon to Dublin under Visual Flight Rules (VFR) must remain in visual contact with the ground at all times. The highest point on the Slieve Bloom plateau is 1,729 feet above mean sea level (AMSL). With a cloud base of, say, 1,000 feet AMSL, a direct Shannon–Dublin track is not available, because it would require overflying the plateau into cloud. The crew's only option is to offset the direct track to the east or west of the plateau.

Which side is chosen is dictated by the prevailing air mass — wind direction, cloud base, and any associated turbulence, which in strong winds can be significant. The predominant winds in Ireland are from the south, south-west or west. To avoid turbulence and remain on the upwind side of the plateau, most crews would, in those conditions, route to the west of the plateau — whose south-western extremity lies in the area of Birr, precisely where the proposed turbines would stand. Turbines in excess of 600 feet in height in that position would constitute a direct flight safety hazard at exactly the point to which poor-weather rotary operations are funnelled.

12.3.4 Material Asset Significance

The integrity of this corridor is a Material Asset in the fullest sense: the capacity to move emergency, rescue, military and medical aircraft safely across the midlands in marginal weather is a public-safety function on which lives depend. Unlike a fixed installation, this asset has no single operator to consult and no boundary fence; its value lies in the continued availability of safe, weather-resilient routing. The proposed development, taken with the consented and proposed turbines at Carrig, Derrinlough, Meenwaun, Cloghan and Cush, would progressively close off the western Slieve Bloom corridor in the very conditions in which it is most needed — a cumulative

erosion of emergency-response capability that the applicant's Environmental Impact Assessment Report does not assess at all.

12.4 LOFAR — Radio Astronomy Facility of National and European Strategic Importance

12.4.1 Status and Function

The Irish Low Frequency Array (I-LOFAR), located at Birr Castle Demesne, is the Irish station of the International LOFAR Telescope (ILT), a Pan-European low-frequency radio interferometer operating across the 10–240 MHz band. I-LOFAR is the most sensitive radio telescope ever constructed in Ireland and connects Irish astrophysics to one of the most sophisticated astrophysics research infrastructures in the world.

Key features of the facility, drawn from the I-LOFAR consortium and Science Foundation Ireland, are summarised below:

- Constructed with a foundation grant of €1.4 million from Science Foundation Ireland and total support exceeding €3 million from Science Foundation Ireland, Enterprise Ireland, Offaly County Council, private donors and eight partner universities in Ireland and Northern Ireland;
- A vital component of a major €150 million European radio telescope network with eight international partner countries, currently in the process of applying to become a European Commission European Research Infrastructure Consortium (ERIC);
- Officially opened in July 2017 by the Minister of State for Training, Skills, Innovation, Research and Development;
- Sited at Birr Castle following two years of test array observations which confirmed the location as the most radio-quiet site available in Ireland;
- Operating within Birr Castle Demesne, which was added to Ireland's UNESCO World Heritage Tentative List in April 2025.

12.4.2 Vulnerability of the Facility to Wind Turbine Interference

The function of a radio telescope is to detect signals of extraordinarily low power originating from astronomical sources often billions of light years distant. I-LOFAR is, by design, among the most sensitive radio receivers operating anywhere on the island

of Ireland. That sensitivity, which is the basis of its scientific output, also makes it acutely vulnerable to terrestrial sources of radio noise. The I-LOFAR consortium has publicly and repeatedly stated that wind turbines are among the most damaging such sources.

Two distinct mechanisms by which wind turbines degrade radio astronomy are identified in the peer-reviewed literature (including Winkel and Jessner, 2018) and are acknowledged by the I-LOFAR consortium on its own published guidance:

- **Direct unintentional emission.** Although wind turbines are not designed as radio transmitters, their power electronics, switching converters, generators and control systems emit radio energy across a broad range of frequencies overlapping the LOFAR observing band. These emissions enter the telescope through both its main beam and its sidelobes.
- **Reflection and re-radiation.** The large rotating metal blades of modern utility-scale turbines act as efficient reflectors of pre-existing radio transmissions (for example terrestrial DAB radio), causing the telescope to receive signals that it would not otherwise detect, and modulating those signals at blade-passing frequencies in a way that is particularly destructive to astronomical observation.

The consortium's own published position on its website (lofar.ie/windfarms) states that, in the worst case, interference from such sources can "completely blind a sensitive radio telescope such as I-LOFAR." This is not a contingent or speculative outcome; the same has been demonstrated empirically at the LOFAR core in the Netherlands and at LOFAR stations across Europe.

12.4.3 I-LOFAR's Established Position on Wind Farms in the Birr Area

In its formal submission on the Draft Offaly County Development Plan, the I-LOFAR consortium called for planning regulations that would:

- Prohibit large wind or solar farm development within a FIVE-kilometre radius of the I-LOFAR site at Birr Castle;
- Impose limitations on wind turbine heights within a ten-kilometre radius of the site;

- Require statutory consultation with the I-LOFAR consortium on the specific equipment proposed in any development within that wider radius, as "turbines from certain manufacturers are better than others" in terms of radio interference;
- Provide for field tests to characterise the radio-frequency emissions of any proposed installation before consent.

Birr I-LOFAR

I-LOFAR is a low-frequency radio telescope array located within the grounds of Birr Castle, County Offaly. It forms part of the wider European LOFAR network, spanning over 2,000 km from Ireland to Poland, and is used for detecting extremely weak cosmic radio signals. Due to

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the sensitive nature of its equipment, I-LOFAR operates in a radio-quiet zone and has requested restrictions on nearby developments that could generate electromagnetic interference. I-LOFAR request that there is a 5 km exclusion zone surrounding the I-LOFAR. T1 is at the edge of this buffer (circa 4.96 km from I-LOFAR to closest turbine distance) while the substation and all other turbines are >5 km. Consultation was undertaken with the observatory to inform the assessment of potential impacts. At the time of writing, in relation to Ballincor Wind Farm, no response had been received.

Image above from the Applicants documents shows that the closest Turbine, T1 at the proposed Ballincor Wind Farm site lies 4.96km from the iLOFAR site right on the boundary of the exclusion zone. At eleven turbines of up to 180–185 metres tip height, the development is the largest single source of potential radio interference yet proposed in the immediate vicinity of the facility.

12.4.4 Material Asset Significance

I-LOFAR is, in EIA terms, a Material Asset of exceptional kind. It is a publicly-funded research infrastructure built over more than a decade at a cost in excess of €3 million, it underpins the careers and research output of Irish astrophysicists in eight partner universities, and it is the Irish component of a continental-scale facility that Ireland has committed to support through prospective ERIC membership. Its situation at Birr is not interchangeable with any other Irish location — the site was selected precisely

because it offered the lowest radio-frequency background available in the country. To degrade that radio quiet now, in service of a development that could be sited elsewhere, would be to extinguish a strategic national asset that cannot be replaced.

That the proposal sits at the very threshold of the protective radius I-LOFAR itself defined as the absolute minimum, the Commission is asked to treat its proximity not as a marginal technicality but as a direct encroachment on a scientific facility of international standing — one whose value, once compromised, cannot be recovered.

12.5 Birr Outdoor Education and Training Centre (Birr OETC)

12.5.1 Status and Function

Birr Outdoor Education and Training Centre is a non-profit residential outdoor education facility established in 1989 and operating under the auspices of Laois and Offaly Education and Training Board (LOETB). It is one of twelve OETCs that together form the national outdoor education and training network operated by the ETB sector, and is affiliated to the Department of Further and Higher Education, Research, Innovation and Science and the Department of Education.

The centre operates a four-acre site on the outskirts of Birr with three associated facility locations at Birr, Banagher and Cadamstown. It accommodates up to 74 participants in residential dormitory accommodation, with additional capacity for over 100 in camping facilities, and delivers structured programmes to primary schools, post-primary schools, further education and training students, youth groups and community organisations. Its programme contributes formally to the President's Award (Gaisce), at both Bronze and higher levels.

The activity programme — archery, kayaking, canoeing, rock climbing, raft building, hillwalking, orienteering, ecology, team building and wilderness skills — is delivered using the surrounding landscape, and in particular the River Brosna corridor and the Slieve Bloom Mountains, as a working environment. As the Centre's submission states, this environment is “fundamental, not incidental” to the activities of the Centre.

12.5.2 Impacts of the Proposed Development

The Birr OETC submission dated 18th May 2026 identifies a series of direct and material impacts on the operation of the Centre arising from the proposed development. These are summarised here and should be read in conjunction with the standalone submission of the Centre:

- **Loss of amenity character of the River Brosna corridor.** The river corridor functions as a 'living classroom' for the Centre's kayaking, water safety, biodiversity and environmental education programmes. The introduction of eleven turbines of approximately 180 metres in height into the visual catchment of this corridor would impose an industrial vertical element on a landscape that is currently rural in character and is selected for its rural character.
- **Noise environment.** Outdoor education in a river corridor is reliant on a quiet acoustic environment for instruction, group communication, wildlife observation, and the reflective elements of personal-development programmes. The persistent low-frequency noise associated with operational turbines of this scale is incompatible with that requirement.
- **Construction-phase disturbance.** The Centre raises specific concern regarding sediment runoff to the River Brosna catchment, water quality impacts during construction, and disturbance to river-based activities during multi-year construction.
- **Biodiversity and educational programme degradation.** A measurable reduction in bird and bat populations and in habitat connectivity, of the type widely documented in association with wind farms of this scale, would directly reduce the educational content available to the Centre's ecology and environmental awareness programmes.
- **Programme viability.** Taken together, these impacts amount to a measurable reduction in the quality and viability of the Centre's programmes — a material planning concern under the Planning and Development Act 2000 (as amended).

12.5.3 Material Asset Significance

Birr OETC is part of the State's social infrastructure for outdoor education. It is one of only twelve such centres serving the entire Republic of Ireland and the only such centre operating within the Laois and Offaly ETB area. Its capacity to deliver its statutory function is materially dependent on the amenity and environmental quality of

the River Brosna corridor and surrounding lands. The proposed development would, on the Centre's own assessment, result in a permanent degradation of those assets and a corresponding loss of the public good they support.

12.6 Cumulative Impact on Material Assets

The four Material Assets identified in this chapter are not independent of one another. Each draws value from the same characteristic of the receiving environment: a quiet, low-disturbance rural landscape with an unobstructed visual, electromagnetic and aerial horizon. That characteristic is precisely what the proposed development would extinguish.

In aviation terms, the visual integrity of the River Brosna corridor is the navigation reference on which Birr Aerodrome depends, and the unobstructed airspace over the western Slieve Bloom is the route on which emergency rotary operations rely in marginal weather. In scientific terms, the radio-quiet of the same landscape is the operational basis of I-LOFAR. In educational terms, the rural character of the corridor is the working environment of Birr OETC.

A single development of eleven turbines of up to 185 metres in tip height would, simultaneously and at a single stroke:

- Compromise the safety of operations at a 50-year-old licensed aerodrome and Designated Training Organisation;
- Constrict the airspace available to emergency, rescue, military and medical aircraft transiting the midlands in poor weather, at the very point to which those operations are funnelled;
- Risk degrading, and at the upper bound blinding, an internationally significant publicly-funded radio astronomy facility; and
- Materially reduce the educational value of a State-affiliated outdoor education centre serving thousands of young people each year.

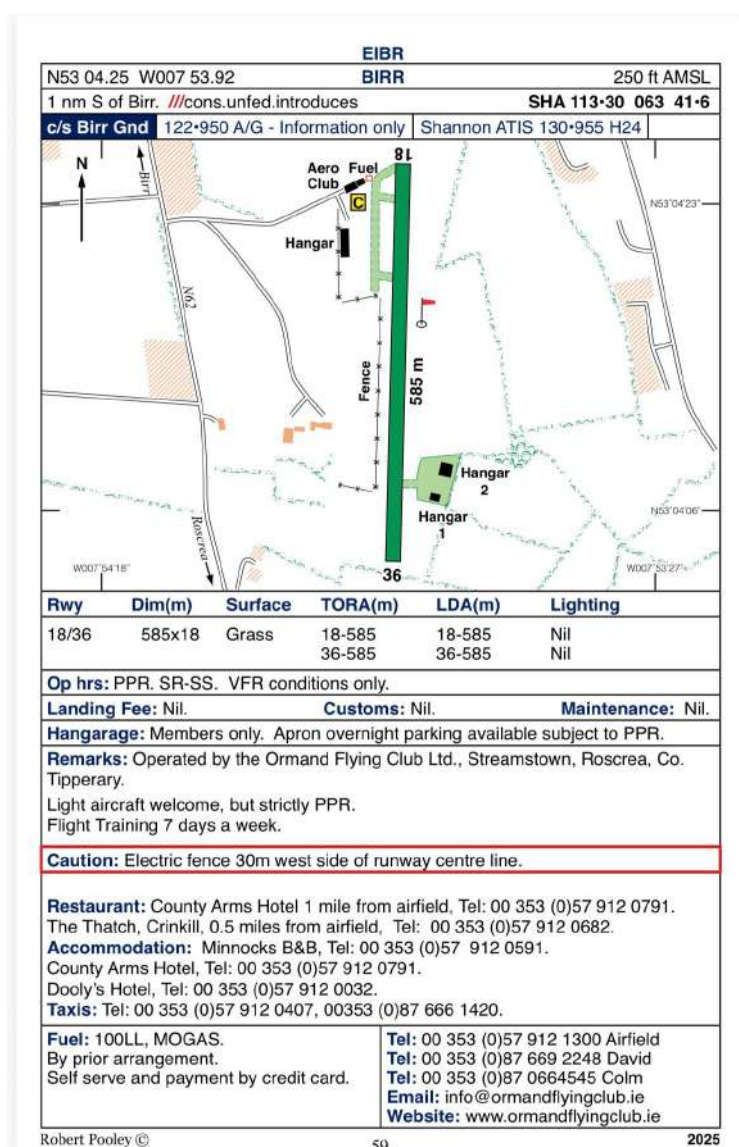
The Environmental Impact Assessment Report submitted by the applicant does not adequately characterise these assets and did not engage with their operators — in the case of Birr Aerodrome, in direct contradiction of a documented direction from the Irish Aviation Authority. It does not assess the **in-combination airspace** effect at all. It does not, in our submission, satisfy the requirement of Schedule 6 of the Planning and

Development Regulations 2001 (as amended) to describe the likely significant effects of the proposed development on Material Assets.

Appendix: 12 Aerodrome

1. History and Context

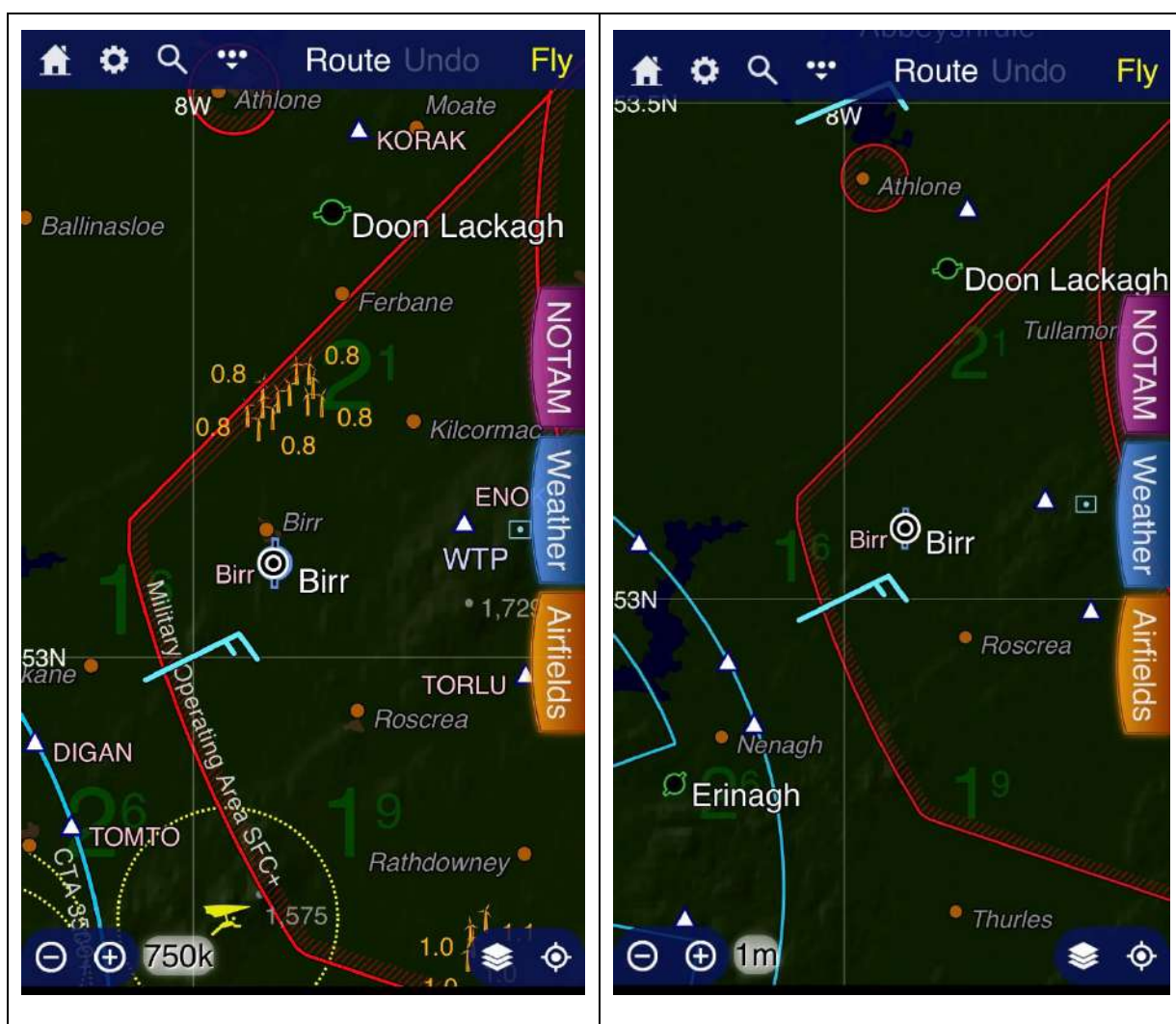
Ormand Flying Club has operated from Birr Aerodrome (official designation EIBR under the International Civil Aviation Organisation) for over fifty years. The airfield is located approximately one nautical mile south of Birr, County Offaly, and is licensed by the Irish Aviation Authority. The club holds Designated Training Organisation status, also granted by the Irish Aviation Authority and trains pilots to Private Pilot Licence standard in accordance with EASA (European Aviation Safety Agency) regulations. This is the Pooleys Plate – Aerodrome Chart for Birr. EIBR is the identifier for Birr Aerodrome.



The airfield operates a single grass runway orientated north-south (designated 18/36), approximately 585 metres in length, at an elevation of approximately 250 feet above mean sea

level. Operations are conducted under Visual Flight Rules only. There is no air traffic control service thus separation from other traffic and obstacles is achieved by pilots through visual reference and situational awareness. This is the standard operating model for general aviation training aerodromes throughout Ireland.

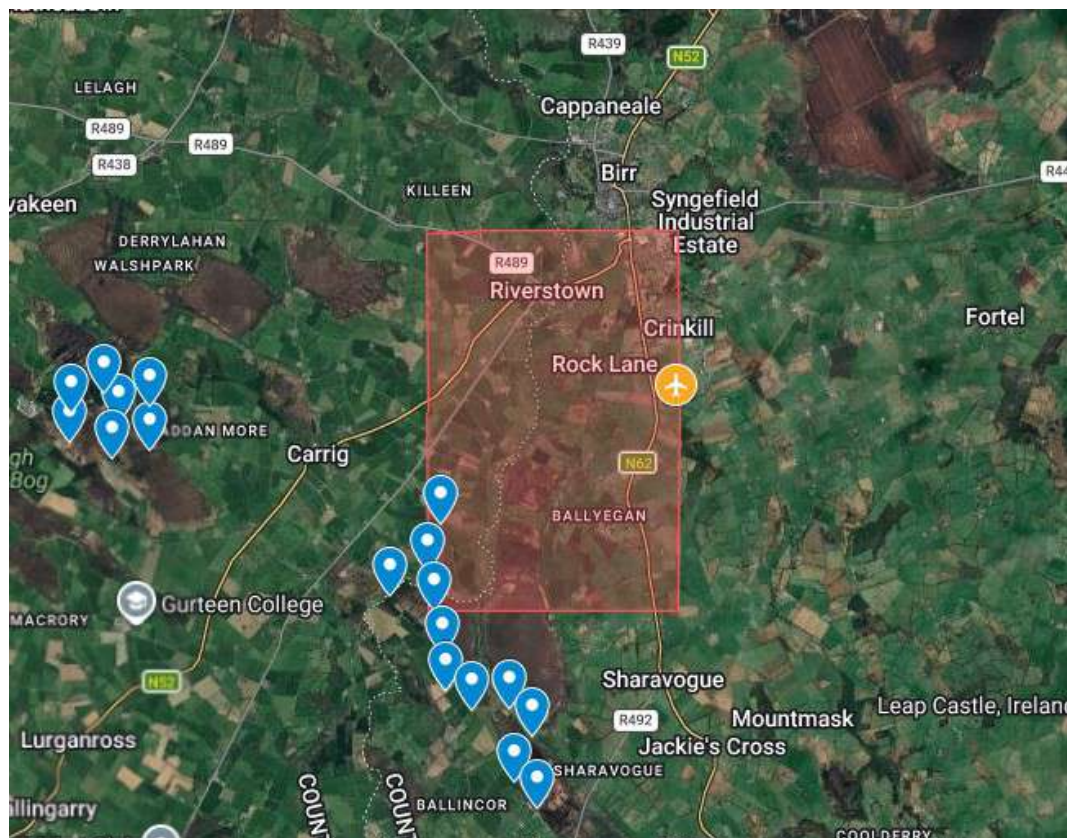
The club is widely regarded as the oldest grass-runway flying club in Ireland. Its activities include pilot training, skydiving operations, recreational flying by members and visiting pilots, regular fly-in events and airshows that attract attendance from across Ireland. The aerodrome has been used for helicopter emergency and rescue services when responding to tasks in the local area and operates within a designated Military Defence Operating Area (see MOA5 Military Operating Area 5 map below).



These characteristics place Birr Aerodrome in a category of airfield that warrants particular consideration in any planning process involving tall structures in the surrounding area. The proposed Ballincor WindFarm development, if permitted, would introduce structures of

approximately 180 metres or greater in overall tip height within airspace that is routinely and necessarily used by aircraft operating from Birr Aerodrome.

The map below illustrates the aerodrome traffic circuit area utilised for training operations at Birr Aerodrome. Please note the proximity and overlap with the proposed wind farm development - T1 a distance of 3.8km / 2 nautical miles away.



The Red Box references the flying and training area

2. Failure of Consultation

According to ACP official records (ABP318666-23) a pre-application consultation meeting was held between RWE representatives and ACP on February 22nd 2024. The matter of the Airfield was raised by the ACP Board where they noted the sites proximity to the Airfield and the need for RWE to consider this in the proposal and submission. See below.

- The Boards representatives discussed the location of the proposed site and asked the prospective applicant if they have assessed wind speeds and has this been taken into consideration in the proposed turbine layout. The prospective applicant stated that they have had wind monitoring devices on site for over 2 years and have been monitoring data collected.
- The Boards representatives pointed out the presence of an airfield located northeast of the proposed development site. They questioned if this airfield is still in operation. The prospective applicant stated that they will take the airfield into account in their assessment.
- The Boards representatives noted the presence of peat on the subject site and stressed the importance that a robust assessment of peat stability be carried out as this could be a significant issue. This issue should be comprehensively addressed in the environmental impact assessment report. The prospective applicant stated that although peat partly overlies the proposed site, there is only one single turbine that will be located on peat. All other turbines will be located on lands currently occupied by forestry, notwithstanding this, the applicant will carry on a robust peat stability risk assessment for this turbine.

ABP-318666-24

An Bord Pleanála

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A second meeting occurred with ACP on May 7th 2025 where RWE claims "Birr Airfield is located outside of their zone of influence". See below. They also advised that they had consulted with the Airfield and provided a layout of proposed turbine locations.

- Following on from a point raised by the Board's representatives, the prospective applicant advised that the proposed development is located approx. 3km from the Birr Airfield and is located outside of their zone of influence. They also advised that they have consulted with the Airfield and provided them with a layout of the proposed turbine locations.
- The Board's representatives noted that it would appear from the site plan

Ormand Flying Club did receive two emails from RWE dated February 14th 2025 and March 19th, 2025 (see below). The subject line in **both** reads RWE Consultation on **Arbourhill, Tipperary WindFarm Proposal**.

From: [REDACTED]
Sent: 14 February 2025 10:48
To: info@ormandflyingclub.ie <info@ormandflyingclub.ie>
Cc: [REDACTED]
Subject: RWE Renewables Ireland Ltd. - Consultation on Arbourhill, Tipperary Wind Farm Proposal

To whom it may concern,

We are writing to you on behalf of RWE Renewables Ireland Ltd. to consult on a wind farm proposal at a site in north County Tipperary. Please find attached information outlining the location and current plans. At this stage we are seeking to identify any potential issues or constraints that we should be aware of as we progress the design of the wind farm and supporting infrastructure.

We would welcome any feedback or information you may wish to share at your earliest convenience.



Best regards,

[REDACTED]

From: [REDACTED]
Date: Wed 19 Mar 2025 at 11:31
Subject: Re: RWE Renewables Ireland Ltd. - Consultation on Arbourhill, Tipperary Wind Farm Proposal
To: info@ormandflyingclub.ie <info@ormandflyingclub.ie>
Cc: [REDACTED]

To whom it may concern,

I am just following up on the below and attached. Please also note that in their response to our email, the IAA suggested direct engagement with yourselves to ensure you were aware of the plans given that you are the nearest aerodrome to the proposed wind farm site.

If there is anything you wish to raise as a potential issue, please don't hesitate to get in touch.



Best regards,

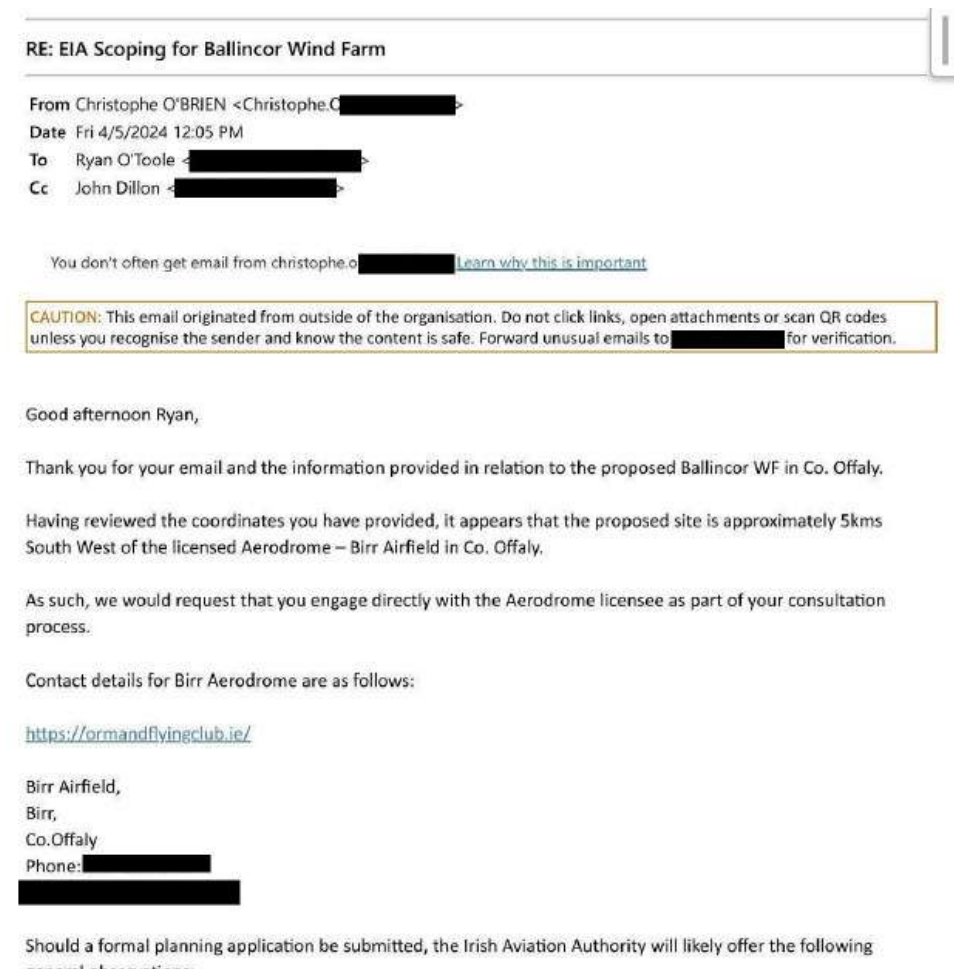
[REDACTED]

There are a number of Townlands in Co. Tipperary named Arbourhill (see below) but none have a direct impact on Birr Airfield.



An email exchange between Officers in Ormand Flying Club determined that these locations are a substantial distance from Birr Airfield and deemed it not relevant. No further communication occurred.

A review of Appendix 1-3 Consultee Responses in the RWE Application files includes two separate interactions between RWE and the Irish Aviation Authority. In both the IAA requested that Birr Airfield and Ormand Flying Club be contacted directly about the Ballincor Windfarm proposal. See below:



There are 4 critical points to be made here:

1. The explicit direction at different stages of the process from both An Comisiuin Pleanála and the Irish Aviation Authority to engage directly with Ormand Flying Club **must** require RWE to do more than send an email late in the process.
2. The RWE statement in the second meeting that the development is **outside** the Airfields 'zone of influence' is wholly inaccurate as will be shown in Section 4 and reflects the lack of consultation this submission underlines.
3. Any correspondence seen by Officers of the Club relates to **a different windfarm in a different area**. The email:
 - references the **wrong** development site;
 - is not included within the applicant's Consultees documentation, meaning it's content cannot be independently verified;
 - was not followed up by any telephone contact, site visit, or meeting;

- may, in any event, have been directed to a general or outdated email address and never received.
4. **No direct contact** was made. This constitutes a serious and fundamental failure, denying a licensed aviation facility the opportunity to engage meaningfully at the appropriate stage of the planning process.

As a direct result of this failure, Birr Aerodrome was unable to engage at the pre-application or Environmental Impact Assessment stage, was unable to provide operational data that would have informed the assessment and has been unable to participate meaningfully in a process that directly affects the safety of its operations. This submission is accordingly made without the benefit of a technical dialogue with the applicant that should have occurred before this stage.

3. Operations of Birr Aerodrome and Ormand Flying Club

Flight Training

Ormand Flying Club operates as a Designated Training Organisation approved by the Irish Aviation Authority and delivers Private Pilot Licence training to EASA standards. Demand for training has grown to the point that additional flight instructors have been engaged. Training activity includes:

- solo and dual circuit flying, with repeated low-level approaches and departures in the immediate vicinity of the aerodrome;
- local area navigation exercises using known ground features as visual reference points;
- cross-country training flights across the midland region;
- trial and introductory flights, which are frequently a member of the public's first experience of light aircraft.

General Flying and Club Activity

The aerodrome is active on a year-round basis, with daily operations the norm outside the winter months of November, December, and January. Activity includes member recreational flying, visiting aircraft, and cross-country arrivals from other Irish aerodromes. The aerodrome

holds both AVGAS and MOGAS fuel, making it a practical transit stop for general aviation traffic across the Irish midlands.

Expanding Operations — Skydiving Partnership

EIBR has been the base of skydiving operations over the years and in more recent times up until 2016. In early 2026, a partnership agreement has been concluded with a skydiving operator, with operations scheduled to commence in Summer 2026. Parachute operations will introduce a significantly different and more complex dimension to the airspace around the aerodrome. Aircraft will climb to drop altitude and release jumpers who will descend under canopy over an extended area. Any obstacle that reduces the safe drop zone or the ability to plan reliable flight paths to and from altitude may directly compromise this operation.

Economic and Community Value

The airfield generates tangible economic and social benefit for the local area. The Annual Breakfast Fly-In has raised in excess of €15,000 annually for the Birr branch of St Vincent De Paul and draws aircraft from aerodromes across Ireland and UK. Multiple additional fly-in events are held annually. Airshows held at the site attract significant public attendance. The Annual Birr Vintage week Airshow is a staple in the calendar and attracts enormous crowds every year. In addition, the aerodrome hosts visits from school groups and Scouting organisations providing educational access to aviation for young people in the region.

These activities are not incidental. They represent the visible output of a licensed aerodrome that has served its community for over five decades and is actively growing. Any development that degrades the safety or operational capability of Birr Aerodrome affects not just the club but the broader community that engages with it.

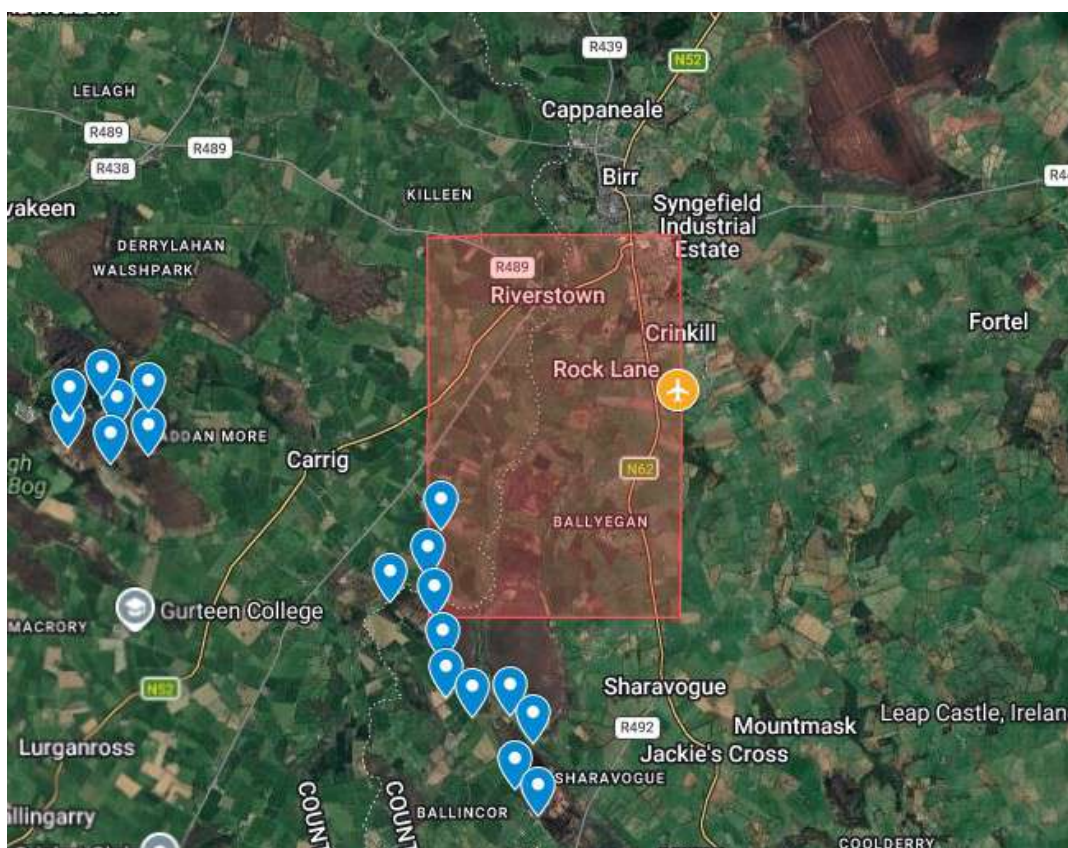
4. Concerns Regarding the Proposed Development

Circuit Flying and Obstacle Clearance

Training circuit flying is conducted at a standard circuit height of 800 feet above ground level around Birr Aerodrome. This is consistent with Irish general aviation practice and is the operationally appropriate height for a runway of this length and type. The standardised rules of the air SERA.5005(f) require aircraft to maintain a minimum clearance of 500 feet above any

obstacle over which they fly. However, 800 feet above ground level is the circuit height, not a height selected with reference to obstacles; it is the standard for safe circuit operations.

Wind turbines of approximately 180 metres tip height — equivalent to approximately 590 feet — would place blade tips at a height that, with the required 500-foot clearance, would demand circuit altitudes in excess of 1,090 feet above ground level in the affected sector. This is not operationally compatible with standard training circuit procedures at Birr Aerodrome. The map below illustrates the aerodrome traffic circuit area utilised for training operations at Birr Aerodrome. Please note the proximity and overlap with the proposed wind farm development - T1 a distance of 3.8km / 2 nautical miles away.



The circuit cannot simply be 'moved'. It is defined by actual wind conditions, the runway orientation, the traffic pattern geometry and the requirement to maintain controlled flight throughout.

Student Pilot Altitude Deviation

A critical and often underappreciated consideration in training environment assessments is the performance envelope of the student pilot, not the qualified one. A student pilot in the early stages of training may deviate from their assigned circuit altitude by plus or minus 200 feet.

This is not negligence; it is the expected variation during the learning process and the reason that 'height-holding' is a core assessed skill. Instructors are trained to manage and correct these deviations.

The consequence of this operational reality is that an aircraft intending to fly at 800 feet above ground level may, at a given moment, be at 600 feet. At that height, in the sector occupied by the proposed turbines, the clearance above a 590-foot tip is a matter of tens of feet. This is not a theoretical risk; it is a foreseeable scenario that arises in the normal course of training operations. The proposed development would introduce a permanent obstacle into airspace where this scenario occurs routinely.

Prevailing Wind and Approach Geometry

Runway 18/36 is aligned north–south. Aircraft take off and land into wind; under prevailing westerly / north-westerly conditions, the active runway and the base and final approach legs of the circuit will be oriented to bring aircraft over or in close proximity to the area in which the proposed turbines are sited. The Ballincor approach sector, identified in the map, is assessed as the more frequently used approach path under typical wind conditions in this part of the midlands.

The implication is that the conflict between circuit traffic and the proposed turbines would not be an occasional or exceptional event. It would be a routine feature of operations under the most common meteorological conditions.

Visual Navigation, Landmark Reliance and Turbulence

General aviation training at uncontrolled aerodromes is fundamentally dependent on VFR rules and visual navigation using clear and recognisable ground features. The River Brosna corridor serves as a **primary visual reference line** for local training flights operating to and from Birr Aerodrome. This is consistent with standard practice at rural training aerodromes, where linear features such as rivers provide unambiguous orientation, positional awareness, and circuit alignment. The introduction of large-scale turbine structures into this corridor would fundamentally alter that visual environment. Turbines of this scale would:

- Compromise the clarity of the river as a navigation reference
- Introduce significant vertical elements that compete visually with the underlying landscape

- Create visual distraction and increase pilot workload, particularly for student pilots still developing situational awareness

In a training context, where pilots are required to maintain aircraft control, monitor altitude, and navigate visually, the introduction of multiple large moving structures (rotating blades) within a primary reference corridor creates a material risk of confusion and misjudgement of position.

In addition the turbines would create a significant physical obstacle hazard and generate mechanical turbulence and wake effects in their lee. Under moderate to strong wind conditions, turbulent wake extending downwind of turbines of approximately 180 metres in height can persist for several rotor diameters — potentially several hundred metres — at altitudes consistent with general aviation training flight.

For a student pilot operating a light training aircraft, the combination of:

- Reduced clarity of visual reference points
- Increased cognitive workload
- Unexpected turbulence in proximity to terrain and obstacles

represents a **serious and unacceptable safety risk** within an established training environment.

Uncontrolled Airspace and the Absence of Radar Separation

Birr Aerodrome operates in class G uncontrolled airspace. There is no radar service and no air traffic control providing separation. Pilots are responsible for their own separation including terrain and obstacle avoidance using visual reference. In controlled airspace, a controller may alert a pilot to a conflicting obstacle or traffic; here, no such safety net exists.

This is precisely why wind turbines in the vicinity of uncontrolled general aviation aerodromes and particularly within the circuit pattern require careful scrutiny. The margin for error is carried entirely by the pilot. Introducing dominant obstacles into routinely used training airspace removes margin that, in a controlled environment, might be recoverable. At an uncontrolled aerodrome, it is not.

Emergency Services and Military Operations

Birr Aerodrome is situated within a designated Military Defence Operating Area. The airfield is referenced in Pooley's flight guide and identified in relevant navigation plates for the midland

region. The aerodrome has served and continues to serve as a base for helicopter emergency and rescue service operations. These activities involve low-level flight by aircraft under operational pressure, often in degraded weather conditions.



Introducing large obstacles into the area used for such operations demands specific and detailed assessment. We are not aware that the implications for helicopter rescue operations or military activity in this area have been adequately considered or addressed in the applicant's submission.

Aviation Lighting, Distraction, and Night Environment

Operations at EIBR take place within day Visual Flight Rules hours — from 30 minutes before sunrise to 30 minutes after sunset. In practice, this means flights regularly occur in the low-sun conditions of early morning and evening, when glare, shadow, and reduced contrast affect a pilot's ability to identify and judge distance to obstacles. Turbines of this height are required to carry aviation warning lighting and in an area currently free of tall structures, the introduction of multiple flashing red obstruction lights alters the visual environment during these marginal daylight periods. The concern is not night operations — the aerodrome does not conduct them — but the degraded visibility at the edges of the operating day when a clear, uncluttered visual horizon matters most. This is an operational consideration that has not been addressed in the applicant's submission.

5. Conclusion

Birr Aerodrome is not a peripheral land use to be noted and set aside. It is a licensed aviation facility, recognised under its ICAO designation, that has operated safely for over five decades, that is actively expanding into skydiving operations in 2026, and that delivers measurable training, economic, and community value to the region. The proposed development cannot be reconciled with the continued safe operation of that facility.

The proposed turbines, at approximately 590 feet tip height, intrude directly into airspace routinely used for training circuits flown at 800 feet above ground level, leaving clearances that — once the normal ± 200 -foot altitude deviation of a student pilot is accounted for — reduce to a matter of tens of feet. That conflict is not exceptional; under the prevailing westerly and north-westerly conditions of the Irish midlands, the affected approach sector is the more frequently used, making the hazard a routine feature of operations rather than an occasional one. These risks are carried entirely by the pilot, in Class G uncontrolled airspace where no radar service and no air traffic control exist to recover the margin for error.

These deficiencies are compounded by a fundamental failure of consultation. The applicant did not make direct contact with a licensed aviation facility lying 3.8 kilometres from the nearest turbine; the correspondence it does rely upon references the wrong development, cannot be independently verified within its own Consultees documentation, and was never followed up. As a direct result, Birr Aerodrome was denied any meaningful opportunity to engage at the pre-application or EIA stage, and the applicant's submission accordingly fails to address — among other matters — the implications for helicopter emergency and rescue operations, for activity within the designated Military Defence Operating Area, for the loss of the River Brosna as a primary visual navigation reference, for turbine wake turbulence at training altitudes, and for the degraded visual environment created by obstruction lighting at the marginal edges of the operating day.

A consultation process that overlooks the very facility most directly affected cannot have produced an assessment capable of properly weighing these risks. On the basis of aviation safety, procedural compliance, and the long-term viability of an established and growing aviation facility, Ormand Flying Club respectfully submits that the application, as presented, is unsafe and unsound, and requests that An Coimisiún Pleanála refuse permission for the proposed development.

Appendix: 13 Waste Management

Chapter 13: Waste Management

13.0 Introduction

This chapter sets out the grounds of objection relating to the adequacy of the waste management provisions in the Environmental Impact Assessment Report (EIAR) for the proposed Ballincor Wind Farm. The assessment of waste is contained principally in Chapter 15 (Material Assets, Telecommunications & Aviation), with supporting material in Chapter 2 (Description of the Proposed Project), Appendix 8-3 (Spoil and Peat Management Plan, hereafter the "SPMP"), and the Construction and Environmental Management Plan (CEMP, Appendix 2-3).

It is acknowledged at the outset that the EIAR addresses certain waste streams however, the waste management framework taken as a whole is materially deficient. The EIAR concludes at Section 15.5.2.3 that *"no significant effects on waste/waste management are anticipated"* and that *"no specific mitigation measures are proposed in terms of waste/waste management."* That conclusion is not supported by the evidence presented in the EIAR itself. The chapter rests its "not significant" finding on the premise that waste will be removed to appropriately licensed facilities by permitted collectors. As the grounds below demonstrate, the EIAR has not established that those facilities are available, has not quantified the principal waste streams, has not identified any collector or receiving facility, and has not provided for the hazardous waste arising from the proposed battery energy storage system. Where the foundation of an assessment is unsound, its conclusion cannot stand.

Grounds of Objection:

- **Ground 1** - Reliance on Waste Facilities that are Closed, Unavailable, or Mischaracterised
- **Ground 2** - Construction and Demolition Waste Not Quantified
- **Ground 3** - Inadequate Treatment of Hazardous Waste from the BESS
- **Ground 4** - No Waste Collection Companies or Receiving Facilities Identified
- **Ground 5** - Failure to Address Statutory and Stakeholder Consultation Responses on Waste
- **Ground 6** - No Reference to the Statutory Regional Waste Management Plans
- **Ground 7** - The Chapter's Own Assessment is Internally Inconsistent

13.1 Analysis: Grounds of Objection

13.1.1 Reliance on Waste Facilities that are Closed, Unavailable, or Mischaracterised

Chapter 15, Table 15-1 lists seven EPA-licensed waste facilities across Counties Offaly, Tipperary, Westmeath and Galway. This table is presented as the baseline assessment of the waste infrastructure available to receive the project's waste. The "not significant" conclusion for waste depends entirely on the existence of this capacity. The current operational status of the listed facilities, however, does not bear the weight the assessment places on it.

Facility (Licence No.)	County	Status relevant to this project
Peat Ash Ltd / West Offaly Ash Disposal Facility (W0110)	Offaly	No longer receives active waste. Unavailable to the developer.
Shannon Vermicomposting Facility (W0209)	Tipperary	Not in operation as a waste-acceptance facility; the site is the subject of an ongoing clean-up and legal process, with waste being removed from it to Ballaghveny. Unavailable to receive this project's waste.
Ballydonagh Landfill (W0028)	Westmeath	Closed in 2010. Not accepting waste.
Pollboy Landfill (W0027)	Galway	Ceased operating as a landfill in 2005. Not accepting waste.
Bord na Móna Recycling Ltd (W0240)	Tipperary	Operates as a waste transfer station, not a final waste destination. The EIAR does not identify where waste would ultimately be processed or disposed of after transfer.
Derryclure Landfill (W0029)	Offaly	No confirmation of available capacity or current operational status is provided in the EIAR.
Ballaghveny Landfill (W0078-03)	Tipperary	Potentially operational, but no confirmation of available capacity is provided, no correspondence with the operator is evidenced, and no assessment is made of whether this single facility can accommodate this project's waste alongside its existing

Facility (Licence No.)	County	Status relevant to this project
		commitments — including waste already being transferred to it from the Shannon Vermicomposting clean-up.

Of the seven facilities relied upon, at least three are definitively closed, one is a transfer station rather than a final destination, one is engaged in a clean-up operation rather than accepting waste, and the remaining two have no confirmed available capacity. The status set out above for the closed and unavailable facilities is drawn from reliable, locally-sourced knowledge of these sites; it is open to the applicant to demonstrate otherwise, but the EIAR contains nothing that does so.

Notably, the EIAR's own footnotes (Chapter 15, footnotes 4 and 5) cite contemporary press reporting on the Shannon Vermicomposting clean-up and the transfer of waste to Ballaghveny. The applicant was therefore aware that the site is not a functioning waste-acceptance facility, yet it remains in Table 15-1 as part of the baseline capacity. There are also reported local concerns regarding the Ballaghveny landfill, including concerns about contamination of drinking water and leachate from older cells; the EIAR's reliance on this single facility as the practical destination for the district's waste is advanced without any examination of that facility's capacity, condition, or existing burden.

The condition of Ballaghveny Landfill (W0078-03) — the de facto destination for the district's waste.

The seriousness of the reliance placed on this single facility is illustrated by the matters reported in the local press shortly before this application was advanced. Below is an image of an article headed "*Major concerns' over local landfill*" (*Nenagh Guardian*, 11 June 2026),



it was reported that a local residents' group, the Ballymackey Environmental Group, had attended a meeting of Tipperary County Council to seek a temporary suspension of works on two cells at the Ballaghveny site pending an Environmental Protection Agency review. The group's stated concern is that they are sitting in groundwater that is rinsing waste and releasing leachate into the surrounding environment. The group is reported to have claimed that chemicals including benzene, perchloroethylene, chloride and ammonia are being leached from the landfill, and to have called for removal of the waste, remediation of the site, and testing of local wells and groundwater.

The same report records that elected members tabled motions seeking (i) a temporary suspension of further works on the engineered weather cap on Phase 1 (Cells 1 and 2) of the facility, to allow an independent peer review of the remediation options, and (ii) an expanded, independent programme of groundwater and domestic well monitoring in the vicinity of the landfill. According to the report, the council's officials advised that any interruption to the remediation project could expose the council to enforcement action by the EPA, including potential prosecution, and could jeopardise a €2.2 million programme of environmental protection works funded by the Department of Climate, Energy and the Environment, for which a contractor had already been engaged.

It is not necessary, for the purpose of this objection, to resolve the competing positions on whether the Ballaghveny site is or is not causing environmental harm. What the report establishes is that the very facility the EIAR relies upon as the nearest licensed

waste site and the de facto destination for waste from the district, including the waste already being transferred to it from the Shannon Vermicomposting clean-up, is at the same time the subject of an active, contested remediation programme, an EPA review, and documented community concern about leachate and groundwater contamination. A facility in that condition cannot simply be assumed, without any examination, to have the spare capacity and the unencumbered availability to receive a major wind farm's construction and operational waste over a multi-year period. The EIAR contains no assessment of the facility's remaining void, its remediation status, or its existing commitments, and so provides no basis on which the Commission could be satisfied that this reliance is sound.

Why this matters. The EIAR appears to have reproduced EPA licence-register data without verifying current operational status. A register entry records that a licence exists; it does not establish that a facility is open, accepting waste, or has capacity. This is a desk-based exercise that does not satisfy the requirement to demonstrate that waste can in fact be collected, transported and disposed of at appropriately authorised facilities with available capacity. Because the “not significant” conclusion is built on this table, and the table does not survive scrutiny, **the Commission cannot be satisfied on the evidence before it that adequate, available waste disposal capacity exists for the proposed development.**

13.1.2 Construction and Demolition Waste Not Quantified

Chapter 15 quantifies municipal waste (approximately 73,705 kg over the construction period) and construction-phase wastewater (approximately 3.8 million litres) to a high degree of apparent precision, using national per-capita statistics. By contrast, for Construction and Demolition (C&D) waste other than soil and stone — concrete, brick, tile and gypsum waste, mixed C&D waste, and wood, paper, glass, plastic and metal — the chapter states only that these “*are anticipated to be small and will be segregated and managed appropriately on site*” (Section 15.4.2.3). No volumes are provided for any of these streams.

That assumption is unsupported for a project of this scale, which involves, among other elements:

- Eleven turbine foundations, each requiring a substantial pour of reinforced concrete (in the order of several hundred cubic metres each, amounting to several thousand cubic metres in total);
- An extensive internal site road network and hardstanding areas;
- A battery energy storage system (BESS) comprising 90 container units;
- A 110 kV substation and associated buildings;
- Multiple temporary construction compounds operating over the construction period;
- Forestry felling to facilitate the development; and
- A grid connection route of approximately 12.23 km, the construction of which will generate excavated road-surface arisings (including potentially tar-bound and contaminated material from the public road network).

The packaging, off-cuts, formwork, damaged components, surplus concrete and metal waste arising from works of this magnitude cannot reasonably be characterised as “small” without any supporting calculation. The point is not merely that figures are missing; it is that **the absence of any quantification makes it impossible to assess whether the waste infrastructure relied upon in Ground 1 has the capacity to receive these materials, or whether the waste hierarchy has been meaningfully applied.** The Commission is left unable to conclude that the principal construction waste streams can be accommodated, because the applicant has not stated what they are.

13.1.3 Inadequate Treatment of Hazardous Waste from the BESS

Chapter 2 (Section 2.10.2) acknowledges that lithium batteries are classified as hazardous waste. The proposed BESS comprises 90 container units and the wind farm has a stated operational life of 35 years. In respect of this hazardous waste stream, the EIAR states only that batteries requiring replacement “*will be removed using licenced/permitted waste management companies.*” Chapter 15 — the chapter

dedicated to the assessment of waste — makes no mention of hazardous waste management protocols for the battery storage system at all.

The following are absent from the assessment:

- Any estimate of the quantity of battery waste likely to arise over the 35-year operational life, including from routine replacement and from end-of-life decommissioning;
- Any storage protocol for damaged, degraded, or end-of-life battery units pending collection, including fire-safe and containment provisions;
- Any identified, authorised disposal or recovery destination for hazardous lithium battery waste; and
- Any assessment of the consequences of a hazardous-waste event (such as cell damage or thermal runaway producing contaminated firewater or residues).

This gap is of particular concern given the environmental sensitivity of the receiving environment. The site lies in proximity to the Little Brosna River and to the Sharavogue Bog Special Area of Conservation. Hazardous waste arising from the BESS, if not provided for, presents a pathway to these receptors. The absence of any hazardous waste management protocol for a 90-unit battery installation, on a site of this sensitivity, is a material deficiency, and **the Commission cannot be satisfied that hazardous battery waste will be managed so as to avoid significant effects on the adjacent water-dependent and protected habitats.**

13.1.4 No Waste Collection Companies or Receiving Facilities Identified

Chapter 15 repeatedly states that waste will be removed by “a permitted waste collector” or by “suitably permitted commercial waste collectors” (e.g. Section 15.5.2.3). At no point does the EIAR name any collector, confirm that any collector holds the necessary permit under the Waste Management (Collection Permit) Regulations 2007 (as amended), or demonstrate that any collector has been contacted or engaged.

The same vagueness affects wastewater. Chapter 2 (Section 2.9.3) states that wastewater will be tankered off-site by a permitted waste collector, but does not identify the collector or the destination treatment plant, stating only that “when the final destination of the wastewater is known following the appointment of a permitted

contractor, this information will be submitted to the Planning Authority." In other words, the destination of the waste is expressly deferred to a point after the determination of the application.

For a project generating waste across two counties over a construction period of approximately 24 months, this is insufficient at the planning stage. Taken together with Ground 1 (the listed destinations are largely closed or unavailable) and Ground 2 (the volumes are unquantified), the absence of any identified collector or receiving facility means **there is no point in the waste chain — arising, collection, transport, or final destination — at which the EIAR demonstrates a verified, available route for the project's waste.**

13.1.5 Failure to Address Statutory and Stakeholder Consultation Responses on Waste

Specific waste-related concerns raised during consultation are not substantively addressed in the assessment:

- **Uisce Éireann — waste sampling strategy for backfill.** Uisce Éireann requested that, where backfilling of excavated material is proposed, a waste sampling strategy be included to ensure the material is inert. The SPMP (Appendix 8-3) was the appropriate document in which to provide such a strategy. It contains no waste sampling or testing protocol; it proceeds on the assumption that all excavated peat and mineral soils are suitable for on-site reuse without any characterisation testing. Chapter 15 does not reference this requirement at all. A specific measure requested by a statutory consultee is therefore simply absent from the documents in which it should appear.
- **Uisce Éireann — abstraction from / discharge to protected sites.** Uisce Éireann also asked that consideration be given where water is taken out of, or put into, a protected site. The EIAR does not connect this concern to the waste management framework. In particular, it does not address how settlement-pond sludge, silt-trap residue, or filtration-unit residue — each of which is a waste requiring characterisation and lawful disposal — will be managed, nor how this interacts with the protected status of the receiving environment.

- **Fáilte Ireland — amenity and tourism.** Fáilte Ireland identified that waste can impact tourism. Neither Chapter 15 nor Chapter 2 addresses how construction waste, litter, or the visual impact of waste storage at the temporary compounds over the construction period will be managed so as to protect the amenity of the surrounding area.

Where a statutory consultee requests a specific protective measure and that measure is neither provided nor explained, the EIAR has not discharged its function. **The Commission cannot treat these consultation responses as answered when the requested measures do not appear in the application documents.**

13.1.6 No Reference to the Statutory Regional Waste Management Plans

The proposed development straddles Counties Offaly and Tipperary, which fall within two different statutory waste-planning regions. Chapter 15 does not reference the Eastern-Midlands Region Waste Management Plan (covering Offaly) or the Southern Region Waste Management Plan (covering Tipperary). There is no assessment of whether the proposed approach to waste is consistent with the objectives of those plans, including their targets for waste prevention, reuse, recycling, and diversion from landfill. In the absence of any such assessment, the Commission cannot be satisfied that the development's waste management is consistent with adopted regional waste policy.

13.1.7 The Chapter's Own Assessment is Internally Inconsistent

The conclusion at Section 15.5.2.3 that *"no significant effects on waste/waste management are anticipated"* — and the consequent decision that no specific mitigation is required — sits in direct tension with the contents of the same chapter and its supporting documents. Within the EIAR, the assessment simultaneously:

- Lists, as its baseline waste infrastructure, facilities the majority of which are closed, unavailable, or are transfer stations rather than final destinations (Table 15-1; see Ground 13.1.1);
- Acknowledges (via Chapter 2) that excavated road-surface material from the public road network, which may include tar-bound or contaminated material, will require disposal to licensed waste facilities, but does not identify which facilities;
- Defers all substantive waste management measures to the CEMP (Appendix 2-3) without summarising, within the chapter itself, what those measures actually are;
- Provides project-specific quantities for municipal waste only, relying on national statistics, while leaving the principal construction waste streams unquantified (see Ground 13.1.2); and
- Concludes that no mitigation is required, while the embedded text simultaneously commits to segregation, the use of permitted collectors, and compliance measures — which are themselves mitigation.

A finding of “no significant effect” is the end-point of an assessment, not a substitute for one. Here it is reached before the assessment has demonstrated that disposal capacity exists, before the principal waste streams have been quantified, and before any collector or receiving facility has been identified. **The conclusion is, on the face of the chapter, premature and unsupported.**

13.2 Conclusion

While the EIAR provides adequate treatment of spoil and peat management through the SPMP, and offers statistical estimates for municipal waste and wastewater, the waste management framework taken as a whole is materially deficient. The application:

- Relies on a baseline of waste disposal facilities that are predominantly closed, unavailable, or are transfer stations rather than final destinations, without verifying current operational status or available capacity;
- Fails to quantify the principal Construction and Demolition waste streams for a major infrastructure project, characterising them as “small” without calculation;
- Omits any hazardous waste management protocol for the 90-unit BESS, on a site adjacent to the Little Brosna River and in proximity to the Sharavogue Bog SAC;

- Identifies no waste collector and no confirmed disposal destination, expressly deferring the destination of wastewater to after the determination of the application;
- Does not provide the inert-backfill sampling strategy requested by Uisce Éireann, nor address the other consultation responses on waste; and
- Makes no reference to the statutory Regional Waste Management Plans governing the two counties in which the development sits.

Chapter 15's conclusion that no specific waste mitigation measures are required is not supported by the evidence presented in the EIAR. The "not significant" finding depends on a chain of premises — that facilities exist, that they are available, that capacity is sufficient, that collectors are in place — none of which the EIAR establishes. Where the foundation is unverified, the conclusion drawn from it can carry no weight.

Original Versions of Expert Reports



An Coimisiún Pleanála - Case reference: PAX92.324279

Ballincor Wind Farm and all associated infrastructure

Applicant: RWE Renewables Ireland Ltd.

Agents: Tobin

Independent Expert Opinion for Greater Birr Wind Action Group & An Coimisiún Pleanála
in the context of

Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment (EIA Directive).

European Union Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy.

EU Floods Directive (2007/60/EC): Transposed into Irish law via S.I. No. 122 of 2010 (as amended by S.I. No. 495 of 2015)

European Communities Environmental Objectives (Surface Water) Regulations, S.I. No. 272 of 2009 as amended.

European Communities (Birds and Natural Habitats) Regulations, 2011. S.I. No. 477 of 2011, as amended 2021. SI No. 293 of 2021.

EUROPEAN UNION HABITATS (SHARAVOGUE BOG SPECIAL AREA OF CONSERVATION 000585) REGULATIONS 2017

European Union (2024) REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on nature restoration and amending Regulation (EU) 2022/869. THE EUROPEAN PARLIAMENT THE COUNCIL Brussels, 15 March 2024.

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June 2026



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Report Title: Independent Expert Opinion for Greater Birr Wind Action Group & An Coimisiún Pleanála: Ballincor Wind Farm and all associated infrastructure, Birr, Co. Offaly.
Applicant: RWE Renewables Ireland Ltd. Agents: Tobin.

Legislation of Particular Note:

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- European Communities (Birds and Natural Habitats) Regulations, 2011. S.I. No. 477 of 2011.
- European Communities (Birds and Natural Habitats) (AMENDMENT) Regulations, 2021. S.I. No. S.I. No. 293 of 2021.
- EUROPEAN UNION HABITATS (SHARAVOGUE BOG SPECIAL AREA OF CONSERVATION 000585) REGULATIONS 2017.
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Date: 24th June 2026

Prepared by: Dr. Pamela Bartley B.Eng, M.SC., Ph.D.

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Statement of Expertise Pamela Bartley B.Eng., MSc., Ph.D

This report has been prepared by Dr. Pamela Bartley. She is a water focussed civil engineer and is considered an Expert Service Provider (ESP) in the matter of construction impacts on hydrology and hydrogeology. Pamela is a team member in Environmental Impact Assessments and the preparation of Environmental Impact Assessment Reports (EIARs) for the extractive industry in Ireland.

Pamela is engaged as an independent consultant to Uisce Eireann, Group Water Schemes supplying potable water to the public, regionally important quarries. She has over 25 years of field based practice in borehole drilling, groundwater monitoring and abstraction point management and the assessment of rivers for the purposes of Section 4 Discharge and Water Pollution Act evaluations. Her Ph.D was a field based Impact Assessment tying actions at the land surface to responses in water by application of the Source Pathway Receptor (SPR) Risk Assessment model. Pamela is qualified and IOSH certified to act as PSDP (Project Supervisor Design Phase) & PSCS (Project Supervisor Construction Stage) as defined by the Construction Regulations. She has a wealth of experience in working at large scale construction sites involving earth movement and placement of rock, such as would occur in the construction of pads for Turbine erection. She is co-owner of Hydro-G and this Ltd. company is a registered Irish Water Supplier (no. 1855). Pamela Bartley is HSQE approved within Irish Water and is one of their Hydrogeologist Framework service providers. Upon completion of a Diploma in Water and Wastewater Technology at Sligo RTC, she completed a degree in Civil Engineering at Queens University, Belfast and then completed a Master of Science in Environmental Engineering followed by a hydrogeological focussed Ph.D. on Karst Groundwater Impact: both postgraduate degrees were completed within the school of Civil Engineering at Trinity College, Dublin.

Her key work areas are groundwater impact and groundwater use. Pamela has successfully completed post doctorate formal course training in the areas of:

- PSDP & PSCS (IOSH certified, 2016)
- Karst Hydrogeology (GSI, 2013)
- Planning & Development Act (IE, 2010) & Expert Witness (IE, 2011)
- On Site Wastewater & Water Services Amendment Act 2012 (IE, 2012 & Dublin 2012)
- Zero Discharge Willow Wastewater Systems Design Courses (Denmark 2008 & 2011 & Ireland 2012)
- Surface Water Regulations 2009 & Assessment of Licensing (DoE, 2010 & 2011)
- Sustainable Drainage (Wallingford/CIRIA, 2005 & 2008)
- Source Protection Zone Delineation (IGI/GSI, 2007)
- Groundwater & Contaminant Microbiology (IGI/GSI, 2006)
- Site Suitability Assessment (FETAC, 2002) & Applied Groundwater Modelling (ESI, UK, 2000)

As a result of work in evaluating planning appeals, Pamela has become specialist in planning evaluations in the context of enacted Irish Regulation and EU Directives concerning EIA and the water environment such as the European Parliament and Council Directive 2014/52/EU amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment (EIA Directive), Groundwater Regulations (S.I. No. 9 of 2010 & Amendment Regulations S.I. No. 366/2016), Surface Water Regulations (S.I. No. 272 of 2009 & Amendment Regulations S.I. No. 386 of 2015), Water Framework and Habitats' Directives. She has been an invited guest speaker at An Bord Pleanála, The Irish Concrete Federation, The Health Service Executive, Environmental Health Officers National Conference, The Irish Planning Institute's National Conference, The International Association of Hydrogeologist's National Conference (Irish Branch) and has delivered hydrogeological lectures to the public during Science Week. In the past, she has held full time lecturing positions in third level institutions (WIT & CIT, 1996 – 1999), delivered practical laboratory instruction in the assessment of subsoils for the FETAC Site Assessor programme and also demonstrated hydraulics laboratory and practical field survey tutorial modules at Trinity College Dublin (1996). Pamela is a qualified and certified 'Site Assessor' and has been an interviewer of examination candidates in respect of eligibility for the Site Suitability FETAC Qualification.

Pamela Bartley's company is Bartley Hydrogeology Ltd., registered to trade as Hydro-G. The company holds the industry requisite professional indemnity insurance and employers, public and products liability insurances.

1.0 Introduction

The Greater Birr Wind Action Group engaged Dr. Pamela Bartley to independently assess the water, construction and Conservation Objective site information related to the proposed Ballincor Wind Farm in which RWE, through their agents Tobin, propose 11 Turbines and a Grid Connection. Dr. Pamela Bartley's Statement of Expertise is provided at the beginning of this report. In overall summary, she is an experienced EIA practitioner with water, soils, subsoils and nature conservation expertise.

The centre of the overall construction zone for the Turbine Masts and their foundations is primarily in a townland named Cloonaheen and it is c. 6.4 km to the south, south east, of the town of Birr, Co. Offaly.

The river named the 'Little Brosna River' flows between the proposed construction lands and the western boundary of the Sharavogue Bog SAC (Site Code 000585).

The lands proposed for construction are hydraulically connected by the Little Brosna River and details presented by the applicant's agents acknowledge that the Little Brosna River floods into the proposed development area. The lands proposed for construction are hydrogeologically classified by the Geological Survey of Ireland (GSI) as the same type of lands in the subsurface, named 'Cut over raised peat' subsoil (Quaternary Sediment). There is a hydrologically and hydrogeologically extremely interesting pocket of 'Gravels' and a connected Esker mapped by the GSI in the middle of the proposed red line application area. However, the applicant's agents have drawn a line around this to suggest that it is separate from the proposed development area. Nature does not separate itself on the basis of red lines drawn on maps by agents for applicants. Neither would An Comisiún Pleanála exclude the significance of the Gravels and Eskers and the cut over raised peats of the proposed development area and Sharavogue Bog SAC.

2.0 Proposed Development

The proposed project will involve 11 Wind Turbine Generators with a blade tip height between 179.5 and 180 m, rotor diameter between 149 to 163 m, hub height of between 98.5 and 105 m. These Turbines will require large cranes and vehicles for their assembly on site and erection. The works will require construction of 'hardstanding', which is an engineering term for lands stripped of their soil cover and covered with rock so as to allow traffic of cranes and delivery vehicles. The turbine foundations at each turbine location will require excavation into peatlands and river banks of rivers documented in the applicant's application documents to be flood zones.

In addition, construction works to enable the private energy proposal would require excavation works and traffic management along public roads and private land for 12.23 kms of trenches for a grid connection to the existing Dallow 110 kV substation. These works would include the construction efforts for the installation of 17 joint bays along the grid connection route ("GCR") across the townlands of Cronekill, Castletown, Cornhill, Caherhoereigh, Pallas, Kyleneamuck, Tinnakilly, Ballyloughnane, Killeen, Croghan, in Co. Tipperary and Townparks, Dovegrove, Woodfield or Tullynisk, and Clondallow in Co. Offaly.

There will also be societal and environmental impacts associated with the proposed Turbine Delivery Accommodation works, road surfacing works and temporary wall/vegetation removal. Additional road construction proposed will be the excavations and loading of materials to provide roads that can actually accommodate the scale of machinery required for the RWE project. The roads will require widening to a clearance width of 5.5m so as to allow for Turbine delivery. This means the roads are not suitable at the moment. A particular pinch point is the Sharavogue crossroads, Sharavogue, Co. Offaly, which is in proximity to Sharavogue Bog SAC (Site Code 000585) and that SAC is in active conservation measures as a showcase forerunner in Ireland's efforts under the Nature Restoration Laws of Europe.

Details provided by the applicant include a requirement to upgrade existing access tracks, construction of new founded access roads and floating roads. The proposed total length of access roads will be 9.7 km. On the basis that the information provided by the applicant suggests that main roads will require widening to 5.5m clearance width to enable Turbine delivery trucks and their lifting cranes, it is reasonable to assume that the 9.7 km of internal access roads will result in 5.5 m width of clearance, scraping of soil and alteration of the hydrological and hydrogeological catchment. For a length of 9.7 km (9,700 m) and a width of 5.5 m it is determined that within the construction area only at least 5 hectares of catchment will be altered by heavy machinery and Excessive Loads for

the purposes of internal track roadways (9.7Km *1000m *5.5m clearance = 53,350 m² = 5.3 hectares). Similarly, for the proposed 11 number Turbines, having 'rotor diameters between 149 to 163 m', it is calculated that the excavated hardstanding pads built to accommodate the cranes will amount to a total area of at least 7 ha of catchment alteration (156m average rotor diameter = 78 m rotor blade requiring ground clearance for crane lift in each direction * 11 locations = 66,924 m² = c. 7 hectares). In total, the soils and subsoils of cutover peat will be excavated and compressed by Excessive Loads for at least 12 hectares of one side of the Little Brosna River, which is hydraulically connected to the Sharavogue Bog SAC.

The proposed construction site and development area requires upgrades of two site entrances: one on the Regional Road R492, close to where the Little River Brosna traverses under that road on a narrow bridge and the second modification is associated with the narrow Local Road L1071, which also has many tributaries of the Little Brosna River traversing under it. The Local road is narrower than the narrow Regional road.

Ancillary elements, but not insignificant in terms of potential impacts, are listed by agents for the applicant as follows:

- Erection of 104 m permanent meteorological mast and including lightning pole,
- All associated excavation, earthworks and spoil management,
- Surface water drainage system and sediment control,
- Installation of new clear span watercourse or drain crossings on proposed wind farm site,
- Excavation of rock from 3 mini-quarries (named 'borrow pits' in the application) and 'restoration' of same (assumed a proposal for infill of some nature?),
- One peat deposition area,
- Wheel wash, security fencing & hut,
- Four Temporary construction compounds including site office and staff facilities,
- Installation of 33 kV medium voltage electrical and communication cabling underground between the proposed turbines and the proposed on-site substation and associated ancillary works,
- All electrical plant and infrastructure and grid ancillary services equipment,
- 110 kV electricity on-site substation and switch rooms,
- one EirGrid control building containing welfare facilities and storeroom, wastewater and rainwater holding tank,
- One Independent Power Producer (IPP) control building containing HV switch room, site offices, welfare facilities, wastewater holding tank,
- One Battery energy storage system (BESS) control building containing worker welfare facilities and equipment store, wastewater holding tank, 90 BESS container units, inverters, underground water storage tank (requiring excavation) and associated works,
- All associated infrastructure and services including site works and temporary construction signage,
- Operational stage site signage,
- All related site works and ancillary development including berms, landscaping, and soil excavation,
- Tree felling (7.2 ha) and hedgerow removal (1.1 km) to facilitate construction and operation of the proposed project,
- Hedgerow replanting (1.3 km), peatland works and some token tree planting.

3.0 Independent Literature

Independent scientific literature presents facts of particular relevance to the Inspector's evaluation of renewable energy proposals. Appendix A of this report provides just three scientific papers of note and the Inspector is asked to review their detail and significance to the issues at hand, which are not the generation of more power but of attempting to stop assaulting the natural world.

- (a) Locke *et al.*, (2026) opens with *"Human activities are driving a global decline in biodiversity and are interfering with the natural processes essential for human well-being. Achieving climate and development goals is impossible without keeping nature intact. In this article, we establish the urgent need for a paradigm shift toward a "Nature Positive" (NP) future, where the health and resilience of the Earth system are recognized as the fundamental basis for human prosperity. This requires that humanity acts to halt and reverse the loss of nature by 2030." The same paper closes with "It is time for us to recognize that nature is the foundation of all human affairs. Unless we act swiftly to make the world NP by 2030, our lives are likely to become very difficult in a destabilized Anthropocene.*

- Hydro-G offers that the European Union (2024) Regulation Of The European Parliament And Of The Council on Nature Restoration and amending Regulation (EU) 2022/869 sets out on the path towards attempting to achieve restoration. However, Sharavogue Bog SAC is a prime example of what can be achieved in peatland restoration in 35 years. The Bog was in bad shape before two local farmers

decided to try to save it in 1990. Refer to detail in Section 3.2 of this report. There is no reason why the area proposed for Wind Farm development could not be restored in the same fashion. This would have carbon sequestration benefits, Nature Restoration law benefits and true biodiversity gain.

- (b) Damiens *et al.*, (2021) opens with “*Economic development is increasingly impacting biodiversity, leading to a rise in biodiversity offset policies globally that aim to compensate for biodiversity losses. Many developments generating offsets create long-term, irreversible losses of biodiversity and, therefore, require biodiversity gains from offsets to be retained over the long term to have any hope of achieving “no net loss” (NNL) of biodiversity. This raises important ecological and institutional challenges that current offset mechanisms, built for politico-economic systems with short-term policy horizons, do not sufficiently consider. We explore this issue and discuss several responses to the problem ranging from incremental changes for improving on-ground management, through to major governance shifts required to support the long-term social-ecological resilience of offset sites. We argue that without these changes, at best, NNL policies participate in temporarily reducing permanent biodiversity loss. At worst, they participate in a false promise, distracting institutions from the transformative changes needed to reverse biodiversity depletion*”.

- Hydro-G offers that it has recently well covered in the Irish media that since 2022 none of the renewable energy MWs have been used to assist citizens in reducing their use of fossil fuels. No Climate Action has been achieved. Instead, Ireland is cited as a ‘cautionary tale’ by the UN in the context of every single MW of renewable energy been given to new industry, thereby countering Climate Objectives.

- (c) Habib *et al.* (2024) in Trinity College, Dublin, research opens with “*Ireland has > 50% of the EU’s ocean-raised bogs; however, degradation through land-use activities has transformed them from carbon (C) sinks to sources. Given their significant role in climate mitigation, it is essential to quantify the emissions resulting from land use degradation of these ecosystems*”. They developed a mapping system “using Sentinel-2 imagery, random forest machine learning and Google Earth Engine” and their results are fascinating and are summarised as follows: “*The results revealed that agricultural grassland comprised 43% of the land use on raised bogs, followed by, forestry (21%), cutover (11%), cutaway (10%) remnant peatlands (13%), waterbodies and built-up ~ 1% each. The overall accuracy of the map was 89%. The map was used to estimate CO2 emissions for four classes constituting 85% of raised bogs: cutover, cutaway, grassland, and forestry using the IPCC wetlands supplement and literature-based emission factors, we estimated emissions at ~ 1.92 (± 1.58–2.27 Mt CO2-C-yr⁻¹) and ~ 0.68 Mt CO2-C-yr⁻¹ (± 0.44–0.91 Mt CO2-C-yr⁻¹) respectively. This is the first study to spatially quantify land use and related emissions from raised bogs. The results have revealed widespread degradation of these globally rare habitats, making them net emitters of CO2. The map is vital for the conservation of these ecosystems through restoration efforts, and the methodology can also be applied to other regions with similar peatland land use issues*”.

- Hydro-G offers that the science is abundantly reported and all points to the importance of restoring peatlands such as the areas around the proposed development. It is not enough anymore to greenwash renewable energy. Construction sites with large machinery that will enable turbines to rotate and change air patterns resulting in ‘wake’ is something that has previously been presented to An Commisiun in many other Observations relating to Wind Farm proposals.

4.0 Local Environment Characteristics

4.1 River System & Water Framework Directive

The proposed development site is mapped by the EPA as follows:

- Catchment 25B Lower Shannon
- Little Brosna River, EPA segment name ‘LITTLE BROSNA_040’, EU Code IE_SH_25L020700
- WFD Status (2019 – 2024) = **Poor Status**
- 3rd Cycle = **At Risk**
- EPA (2024) 3rd Cycle Report for Lower Shannon HA25B reports as follows:
 - Good Status Objective Not Yet met, target is 2027
 - Significant Issues = Morphological
 - Significant Pressures = Agricultural, Hydromorphology, Peat Extraction and Drainage.

- LA Waters Programme = AFA = Area for Action. The proposed wind farm site falls within the Little Brosna Area for Action (AFA) designated under the River Basin Management Plan Cycle 2 (2018–2021) and continuing under the Water Action Plan 2024.

With respect to information presented in the EIAR and associated Appendices, information presented to Coimisiún Pleanála for their statutory obligation to complete the EIA is inconsistent and contradictory. Significant issues include, but are not limited to, the following:

- WFD status classifications are reported differently in different parts of the EIAR: for example, Table 9-5 of the Water Chapter reports Status as Moderate whereas Table 2-2 reports Poor Status. Chapter 9's narrative repeats incorrect information. The presentation of baseline environmental information precludes the use of the EIAR for Coimisiún Pleanála's EIA.
- The entire WFD impact assessment in EIAR Chapter 9, and the adequacy conclusions drawn from the SWMP (Appendix 9-4), have been developed against a Moderate baseline rather than a Poor baseline. It is stated that *"The WFD Compliance Assessment follows the structure of Chapter 9 (Hydrology and Hydrogeology) of the EIAR in so far as the three main phases of the proposed project are considered separately... Effects in this section are thus the residual effects identified in Chapter 6 (Biodiversity) and Chapter 9 (Hydrology and Hydrogeology) of the EIAR for each quality element of each WFD water body."* (Appendix 9-1 Stage 3 Compliance Assessment, p.17). Therefore, the WFD Assessment explicitly delegates its own impact and residual effects analysis back to Chapter 9, stating its conclusions are "the residual effects identified in Chapter 9." Chapter 9 used the Moderate baseline. Therefore Appendix 9-1's compliance conclusion is built entirely on Chapter 9's Moderate-baseline impact assessment. Under the Weser judgment (C-461/13, paras 67–69), the difference is legally determinative: at Moderate status, the non-deterioration obligation allows some headroom across quality elements; at Poor status, any deterioration of any single quality element — including a temporary construction-phase reduction in macroinvertebrate community — is absolutely prohibited regardless of overall class change. An impact assessment premised on the wrong baseline status cannot satisfy the Weser obligation. The Inspector cannot resolve this inconsistency by preferring Chapter 9 over Appendix 9-1 because Appendix 9-1 is the specialist document, Table 2-2 is the correct disaggregated classification. The WFD Assessment correctly identifies, as stated in EPA (2024), the 'Significant Issues' driving the declining status as Agriculture (nutrients), Peat Drainage and Extraction and drainage (hydromorphology). Peat disturbance is explicitly listed as a pressure category in this catchment — the same category generated by the proposed development. The Poor and At Risk classification is critical as it captures the notable and trending downward/ deterioration of the waterbody between monitoring cycles.
- There is no quantification of ortho-phosphate loading from proposed excavation areas of disturbed peat. Neither is the effect of the iron content of the waters in the photos of the Trial Pits (Appendix 8-1) evaluated in the context of affecting BOD in associated nutrient-impaired waterbody. Both BOD and ortho-P are Surface Water Regulation parameters with Environmental Quality Objectives. Nutrients (phosphorus, nitrogen) are one driver of Poor status in this catchment.
- The proposed wind farm site falls within the Little Brosna Area for Action (AFA) designated under the River Basin Management Plan Cycle 2 (2018–2021) and continuing under the Water Action Plan 2024. The WFD Assessment (App.9-1, p.15) describes this AFA as a designated Area for Restoration, led by LAWPRO, covering 11 waterbodies. The AFA programme exists precisely to address the pressures — nutrients, peat workings, hydromorphology — that are driving Poor status in this catchment. A development generating the exact pressure categories identified in the AFA recovery programme, in the AFA catchment, is not prima facie consistent with the programme of measures under the River Basin Management Plan (RBMP). Appendix 9-1, Section 3.3, sets out the applicable legal test correctly: whether the proposed project can support delivery of the RBMP programme of measures or has the potential to hinder it. It acknowledges the AFA designation and its objective of addressing nutrient and hydromorphological pressures in the Little Brosna_040. However, no analysis, no findings and no conclusions are progressed. The section ends after describing Sharavogue Bog's rewetting programme without addressing whether introducing a proposal to move and disturb 59,000 m³ of peat, which is the exact pressure category the AFA restoration programme targets, is compatible with or would hinder RBMP delivery. The applicant identifies the test, acknowledges every relevant fact required to apply it, and then declines to complete the requisite test. This gap is not remedied elsewhere in the WFD Assessment. The applicant's WFD Assessment contains two legally distinct obligations that must

not be conflated. Sections 3.1 to 3.2.5, summarised in Table 3-1, address the site-specific impact test: whether the project itself will cause deterioration in waterbody status, with the conclusion that CEMP and SWMP mitigation will ensure compliance. Section 3.3 addresses an entirely separate obligation under Article 4(1)(a)(iii) WFD: whether the project is consistent with the active programme of public measures already committed to restoring this catchment. The Table 3-1 assertion that site-level controls will prevent deterioration cannot release the obligations of the State and the published national Programme of Measures. These are different tests. The first asks whether harm will occur. The second asks whether the development is consistent with Ireland's committed RBMP restoration programme for a catchment where peat workings are a formally identified driver of failure. An Coimisiún Pleanála cannot be satisfied that the Article 4(1)(a)(iii) test has been met on the basis of an assessment that sets out that test, acknowledges the AFA designation and the peat pressure category, and contains no analysis of compatibility with the programme of measures. Coimisiún Pleanála is referred to the detail of Appendix 9-1, Sections 2.1, 3.2.5, 3.3 and Table 3-1 & Ireland's Water Action Plan 2024.

4.2 Conservation Objective Sites

The proposed development site is hydrologically connected to Sharavogue Bog SAC, which is on the other bank of the Little Brosna River. One of the Turbines (T8) is less than 80m from Sharavogue Bog. The Sharavogue Bog SAC has a remarkable story associated with its restoration. Sharavogue Bog has its own Statutory Instrument (European Union Habitats (Sharavogue Bog Special Area Of Conservation 000585) Regulations 2017) protecting it. A Google search, available to all, provides as follows when one enters the prompt "Can you do a search and find a history of how local people and a Dutch university have worked towards protecting Sharavogue Bog SAC County Offaly Ireland"?

- Sharavogue Bog SAC in County Offaly owes its survival to a famous grassroots rescue led by two local Birr farmers in the 1990s, heavily championed and supported by Dutch academics and conservationists over several decades. [1, 2, 3, 4, 5].
- **The Local Heroic Intervention (1990s)**
In 1990, local farmers Liam Egan and Patrick Headon discovered that large-scale drainage channels were being sliced into the high bog, threatening the ecosystem with heavy machinery extraction. Facing unfavourable laws regarding neighbouring land rights, the two men and their solicitor tracked down the title-holder living in England, travelled across the Irish Sea, and jointly purchased the freehold to protect the bog from development. They later entered a management agreement with the National Parks and Wildlife Service (NPWS). [1, 2, 3]
- **The Dutch Connection**
The late 1970s saw the start of a massive Dutch-Irish research and conservation collaboration, famously spearheaded by Dr. Matthijs Schouten of [Wageningen University](#). [1, 2]
- **The "Battle of the Bogs":** Inspired by early conservation victories in Ireland, the Dutch Foundation for the Conservation of Irish Bogs was formed to help fund, study, and advocate for the protection of unique Irish peatlands. [1, 2]
- **Scientific Research:** Wageningen University researchers published extensive hydro-ecological studies focusing on raised bog fauna, which formed the bedrock of the data that helped Ireland secure SAC (Special Area of Conservation) designations. [1, 2, 3, 4, 5].
- **Awards:** In the 2010s, the Dutch Foundation for Conservation of Irish Bogs formally presented Patrick Headon and Liam Egan with a special Award of Merit in the Netherlands, recognizing their vital, locally driven efforts in saving Sharavogue. [1, 2, 3].

Sharavogue Bog SAC (Site Code 000585) is a Priority Habitat site. Its qualifying interests include Active Raised Bog [7110*] and Degraded Raised Bog [7120]. A restoration programme completed in 2021 installed over 400 rewetting dams, expanding Active Raised Bog from 25.8 ha toward a target of over 40 ha and restoring peat-forming conditions across the full 223 ha extent of the bog. This information is confirmed by Appendix 9-1 (p.22) of the application. The bog is in an active ecological recovery phase and water tables are higher than pre-2021 and peat-forming conditions are being re-established. The SAC is most sensitive to any hydrological disturbance. The NIS integrity assessment for Sharavogue Bog SAC in Table 6-2 does not engage with the

restoration status of the site. A distance-based impact assessment is applied using habitat maps. The assessment submitted with the application does not assess whether any change to the peat water table in the lagg zone, where the interface vegetation already indicates active upwelling, could arrest or reverse the post-2021 rewetting trajectory. The public investment in the restoration programme (confirmed in Appendix 9-1, p.22) and the ecological recovery trajectory of the site are relevant to whether any residual risk, however small, is acceptable under Article 6(3). Under Case C-461/17 (Holohan v An Bord Pleanála, 2018, para.44), an Appropriate Assessment must contain complete, precise and definitive findings and conclusions free of lacunae. The 'Source–Pathway–Receptor' chain does exist and the information before An Commission is contradictory.

In pre-planning consultation meetings the Inspector explicitly required the Applicant to consider the full hydrological corridor and any or all impacts therein. The Little Brosna and its tributaries are hydrologically connected to six European sites protected under the Habitats Directive (92/43/EEC) and Birds Directive (2009/147/EC). The NIS (Section 6.1, p.117) acknowledges that, in the absence of mitigation, indirect adverse effects on all six sites from water quality degradation cannot be excluded. The sites are listed in the Tobin Reports accompanying this application for consideration [AA Screening & NIS Section 6.1, p.117; NIS Table 5-1, p.87; WFD Assessment App.9-1, p.22], as follows:

- Sharavogue Bog SAC (Site Code 000585) — a Priority Habitat raised bog, boundary 10 metres from the wind farm site, currently in active restoration following installation of over 400 rewetting dams in 2021.
- River Shannon Callows SAC.
- River Little Brosna Callows SPA (004086) — designated for nationally important populations of wintering Whooper Swan, Bewick's Swan and Golden Plover; Middle Shannon Callows SPA (004096); Dovegrove Callows SPA; Lough Derg (Shannon) SPA.

The NIS (Section 6.1, p.117 onwards) acknowledges that the proposed project, in the absence of mitigation, could result in indirect adverse effects on all six of these sites due to degradation in water quality.

4.3 Flooding and Proposed Development in Flood Zones A & B

The applicant's Flood Risk Assessment (FRA, Appendix 9-3) uses CFRAM Study modelling to establish that four of the eleven proposed turbines are located within Flood Zone A or B under existing conditions. The inundation data for each at-risk turbine, as recorded in the FRA, is as follows:

- **T1:** approximately 25% of hardstand inundated at 1% AEP (1-in-100yr); approximately 35% at 0.1% AEP (1-in-1000yr). Access road sections within flood envelope.
- **T2:** approximately 5% inundated at 1% AEP; approximately 25% at 0.1% AEP. Recorded peat depth 0.3–1.2m. Foundation excavation to 4.5m bgl required.
- **T8:** approximately 5% inundated at 1% AEP. Peat depth 2.1m. Located 50m west of the Little Brosna River and the Sharavogue Bog SAC boundary. Risk Register scores T8 as Distance to watercourse <10m (score 3×3=9, PSRA App.8-2).
- **T9 — most critical:** approximately 50% of hardstand inundated at 1% AEP. Peat depth 3.2m — deepest on the site. Highest flood exposure, deepest peat, closest turbine to the SAC boundary. Risk Register: Distance to watercourse <10m, evidence of surface water flow at hardstand area (PSRA App.8-2).

The Mid-Range Future Scenario (MRFS, +20% peak flows for climate change) are presented as follows:

Turbine 1% AEP (1-in-100yr) 0.1% AEP (1-in-1000yr)

T1	40%	slightly larger
T2	25%	slightly larger
T8	15%	slightly larger
T9	75%	slightly larger

The access tracks are also inundated, in particular the site access track from R492 along the river Brosna is fully submerged and unavailable in a Medium Range Future Scenario. (Reference: FRA App.9-3, pp.11-12; EIAR Ch.8, p.8-22; PSRA App.8-2 Risk Register).

Under the PSFRM Guidelines (OPW/DOEHLG, 2009), wind farms are classified as 'essential infrastructure', appropriate only in Flood Zone C. The applicant acknowledges that the Justification Test is required for T1, T2, T8 and T9. The Applicant clearly sets out the criteria required to satisfy the Justification test (see below) but attempts to satisfy it by simply proposing raised platform levels and an emergency evacuation protocol. To meet the Justification Test the applicant must meet the criteria provided in Box 5.1 of DoEHLG & OPW (2009) Flooding Guidelines, as shown here:

**Box 5.1 Justification Test for development management
(to be submitted by the applicant)**

When considering proposals for development, which may be vulnerable to flooding, and that would generally be inappropriate as set out in Table 3.2, the following criteria must be satisfied:

1. The subject lands have been zoned or otherwise designated for the particular use or form of development in an operative development plan, which has been adopted or varied taking account of these Guidelines.
2. The proposal has been subject to an appropriate flood risk assessment that demonstrates:
 - (i) The development proposed will not increase flood risk elsewhere and, if practicable, will reduce overall flood risk;
 - (ii) The development proposal includes measures to minimise flood risk to people, property, the economy and the environment as far as reasonably possible;
 - (iii) The development proposed includes measures to ensure that residual risks to the area and/or development can be managed to an acceptable level as regards the adequacy of existing flood protection measures or the design, implementation and funding of any future flood risk management measures and provisions for emergency services access; and
 - (iv) The development proposed addresses the above in a manner that is also compatible with the achievement of wider planning objectives in relation to development of good urban design and vibrant and active streetscapes.

The acceptability or otherwise of levels of residual risk should be made with consideration of the type and foreseen use of the development and the local development context.

Note: See section 5.27 in relation to major development on zoned lands where sequential approach has not been applied in the operative development plan.

Refer to section 5.28 in relation to minor and infill developments.

It is noted that the proposed development has NOT BEEN ZONED or designated for wind energy infrastructure. The Supreme Court in *Coolglass Wind Farm Limited v An Coimisiún Pleanála* [2026] IESC 5 was explicit that developments must not be assessed in isolation from their broader county and regional context. Applying that principle here: the Climate action this development is said to serve can be met —is being met — in lower-risk, designated locations within Offaly and across the Eastern Region. The proposal for development of Turbines at Ballincor is not consistent with Flooding Guidance, EIA Regulations given that it is hydraulically connected to an active Natura 2000 restoration catchment in a Poor Status river catchment.

The FRA contains an unresolved material inconsistency in the description of the proposed flood compensation storage. Section 4.4 (p.21) states that the compensation storage “has an area of approximately 14,000m²” and that, to compensate for the approximate 3,000m³ of floodplain removed, this area “should have a depth of approximately 1m.” Section 4.5 (Justification Test) states that “an additional 14,000m³ of compensation storage will be provided.” Furthermore, the FRA's flood compensation calculation uses both 14,000 m² and 14,000 m³ for the same figure in different sections. This is an internal inconsistency that renders the compensation analysis unreliable.

In the matter of proposed construction in Flood Zones A & B, the following is brought to attention:

- The access tracks serving Turbines 8 and 9 run along the eastern boundary of the site, parallel to and within approximately 50–100 metres of the Little Brosna River. This corridor is within Flood Zone A/B as mapped by OPW CFRAM. The applicant acknowledges that T8 and T9 are liable to fluvial flooding in a 1-in-100 year event and that T9 hardstand is 50% inundated under that scenario (Appendix 9-3, p.11–12). The information is presented in a fashion that implies that An Commission should accept that these access tracks can be designed, built and operated in a way that protects a receiving waterbody already classified as Poor Status (2019-2024) and 3rd Cycle 'At Risk' of failing WFD Good Status objectives by 2027 (EIAR Chapter 9, Table 4-1). The critical question is whether the Site Investigation information submitted supports a conclusion that the proposal is feasible. The facts of the case are that the Site Investigation information submitted DOES NOT support a conclusion that the proposal is feasible.
- The Site Investigation information submitted provides as follows:
 - **TP08** (GL 44.38m OD, 30 July 2024, Appendix 8-1A): Peat to 2.1m; soft peaty silt to 3.1m; soft sandy silt to 3.70m. Groundwater at 3.20m. Trial pit terminated due to sidewall collapse. Competent stratum not reached.
 - **TP09** (GL 45.37m OD, 30 July 2024, Appendix 8-1A): Peat to 2.7m; soft peaty silt to 3.70m. Trial pit terminated at 3.70m due to sidewall collapse. Competent stratum not reached.
 - **BH02** (GL 45.34m OD, 18–19 September 2024, Appendix 8-1C): 2.3m of peat, then a continuous column of very soft silt and clay from 2.3m to 12.80m depth. Every Standard Penetration Test from 2.30m to 12.80m returned SPT N=0 — meaning the sampler penetrated under its own weight with zero hammer blows. The first material showing any measurable resistance (SPT N=7, still classified very soft) appeared at 12.80m. Dense gravel did not appear until 15.80–18.80m depth.

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The project's Peat Stability Risk Assessment (PSRA) summarises results in row 9 of the stability calculations Table (Appendix 8-2) in stating "3.2m PEAT in probes, >3.7m peaty SILT in TP09, 12m very soft material in BH02." The undrained shear strength assigned to T9 ground is 22 kPa, which is the lowest on the entire site (Appendix 8-2, Table 2). The stability factor of safety under construction surcharge (ODF Case 2) is 3.4, which is the second lowest on the site, after T4.

The agents for the applicant's design response to ground conditions along access tracks is contained in Appendix 8-3 (p.9-13) and the CEMP (Appendix 2-3). The key statements are:

- "Founded tracks are excavated down to and constructed up from a competent geological stratum" (Appendix 8-3, p.9).
- "Where peat is deeper than 1m, floating roads will be used" (Appendix 8-3, p.12).

Hydro-G advises that these are generic methodology statements. They describe a binary choice — excavate to competent stratum, or float over peat. They do not address the specific ground conditions encountered at TP08, TP09 and BH02, where:

- Peat extends to 2.1-2.7m;
- Below the peat is not competent stratum but soft organic silt;
- The organic silt itself extends to at least 12m (BH02);
- No competent stratum was reached in any investigation point in this zone;
- Sidewall collapse prevented the trial pits from going deeper.
- The floating track methodology (Appendix 8-3, Section 2.4.1) requires placing geogrid directly on the peat surface. It does not address the bearing capacity of the peat when the material beneath it is also very soft. The PSRA stability calculation for T9 (Appendix 8-2, Table 2)

- records an undrained shear strength of just 22 kPa — the lowest value on the entire site — and 12.8m of soft material in the combined depth column. The ODF (Overturning Design Factor) for T9 under construction surcharge is only 3.4, the second lowest on the site after T4. These values relate to the turbine foundation, but they characterise the same ground on which the access track will be built.
- o Nowhere in the submitted documents is it detailed how a track will be designed and built in a zone where the founding material below the peat is itself 12 metres of very soft organic silt. The methodology statement assumes that either competent stratum exists (for founded tracks) or that peat provides adequate support for a floating track (which requires that the peat has some bearing capacity). Neither assumption is validated by the site investigation data for the T8/T9 river corridor.
 - o The PSRA concludes that more investigation is needed before submission (Appendix 8-2, Section 7.1) "detailed design must include "specification of additional site investigations inclusive of in situ testing and laboratory testing in specific risk areas on the site" — an explicit acknowledgement that the investigation submitted with this application is insufficient to design the works in these areas.
 - o The Surface Water Management Plan similarly states it is "a Planning Stage document and will be subject to further revision following Planning Permission and the Detailed Design Stage" (Appendix 9-4, p.1). The applicant is asking the planning authority to grant permission on documents that their own team acknowledges are incomplete and require revision. This point warrants emphasis as the application has been submitted with the acknowledged gap in place. The planning authority is being asked to grant permission before that additional investigation has been done.

4.4 GSI mapped Soils & Subsoils of the Proposed Development Area & Sharavogue Bog SAC

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Of particular note is GSI mapping of the subsoils of the area. Subsoils are referred to as 'Quaternary Deposits' by the GSI. Subsoils are the material underneath the top layer of soil on the earth, which is called Topsoil and is usually only a few inches deep. Subsoils are usually the primary load bearing material of the subsurface, unless bedrock drilling is proposed for foundations. In the case of internal access roads to a development of this nature and the crane hardstandings, the subsoil is the load bearing component.

GSI mapping for subsoils on both sides of the Little Brosna River are presented as Plate A: On the west side of the River the general centre of the proposed application area is shown by Hydro-G with a Red Triangle and on the east side of the river the Sharavogue Bog is shown with a Checkered Flag.

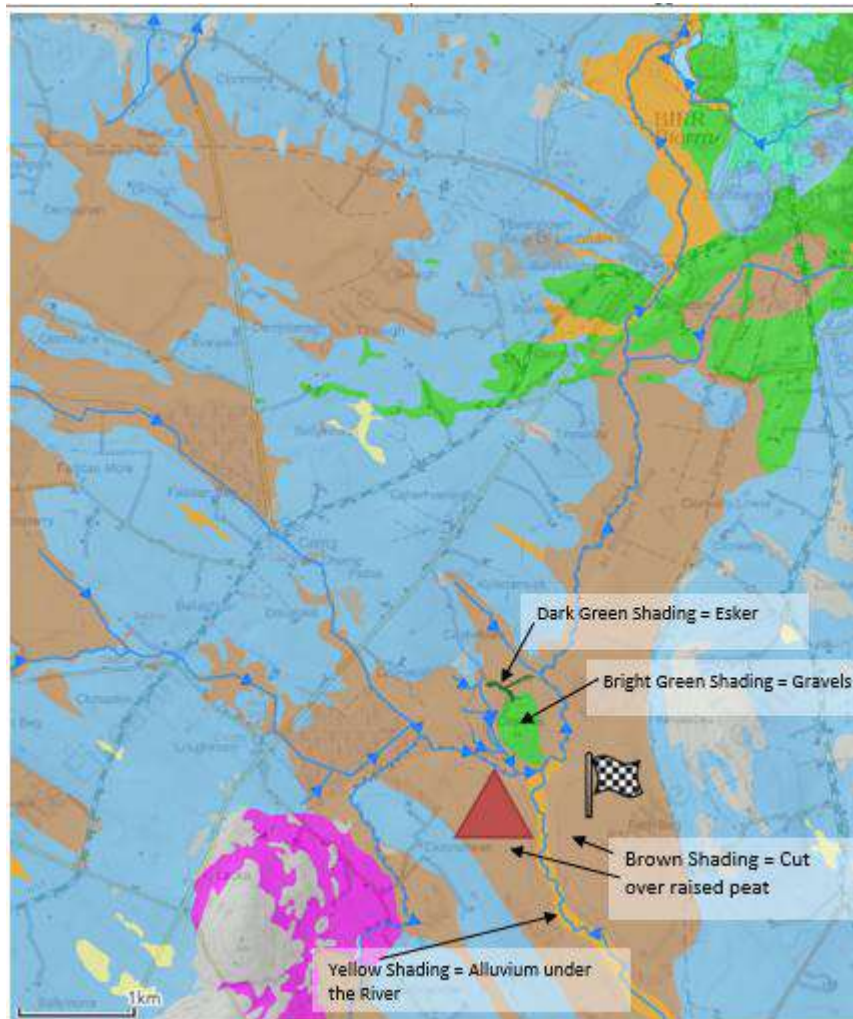
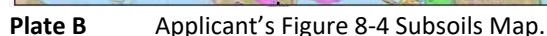


Plate A GSI Subsoil Mapping for the general area with Hydro-G annotations : On the west side of the Little Brosna River the general centre of the proposed application area is shown by Hydro-G with a Red Triangle and on the east side of the river the Sharavogue Bog is shown with a Checkered Flag.

With specific reference to GSI mapped information for subsoils either side of the Little Brosna River, it is observed that the same subsoil exists on both sides of the river. The significance of this information is that the river hydrologically links similar subsurface areas. Also of particular hydrogeological significance is the small pocket of GSI mapped area of Gravels and Esker that is essentially within the proposed development area, although circled as excluded by the applicant's Red Line boundary. We know that large volumes of groundwater can emit from a Peat > Gravels boundary situation and the Esker provides another hydrological and undocumented risk and unknown in the presentation of information for this site. It is interesting to note that the Gravels and Esker have been excluded from the proposed development area's Red Line boundary but the significance of the area cannot be excluded when it is proposed to add Excessive Loads to the boundary of the Peat > Gravel area. It is understood by hydrogeologists that although the areal extent of the gravels is small, the sands and gravels provide a window in the subsoil through which it is easier for groundwater to emerge from the underlying bedrock. The mapped ending of the Esker is coincident with the commencement of a surface water system. This could be a groundwater spring.

The applicant's presentation of subsoils and the Red Line application area is shown on their Figure 8-4 Subsoils Map of the Land, Soils & Geology Chapter, as reproduced here for ease of reference.



The proposal to bring large cranes to work the edges of this cut over peatland area and OPW mapped flood zone presents real risks of increasing the already frequent flood experiences. An Coimisiún Pleanála is requested to compare and contrast the baseline information used to inform the ‘no risk’ conclusion of the applicant’s agents with this independent assessment commissioned by residents of the area. The actual flood experience to date and the frequency of flooding cannot be mitigated by proposing additional heavy load construction at this location. The Desk Study for Flood Risk Analysis (Tobin, 2026) may report OPW mapping for the **current** situation. However the **future** flood risks have not been presented. These are real risks resulting from applying Abnormal and Excessive Loads to wet peatland soil and thereby destroying what small pore space there may have been prior to the construction effort. The Flood Risk Assessment HAS NOT simulated the compaction along proposed internal haul routes and construction pads.

Cranes are required to lift the masts and turbine blades. Counter weights are required to stabilise the cranes. The cranes and counter weights require enabling roads and land surfaces with the ability to carry 750 tonne weight of a crane itself plus the likely 200 tonne counter weight and the chain and hoist infrastructure. The pressure of the weight of the crane and counter weight results in destruction of the permeability and pore space of subsoils in the proposed construction areas, which are lands that are the catchment area of a river that floods in this particular river bank setting.

An Coimisiún Pleanála - Case reference: PAX92.324279

resources, or AI, to fact check potential mass loadings arising from the enabling works that would be required to erect turbines in a flood plain wetland such as at the proposed Wind Farm site. Hydro-G's forays into this realm of AI and civil engineering infrastructure suggest, as follows:

- a. Crane weights (ballast/counterweights) and base loadings required for erecting a 3-blade wind turbine with **hub heights in the 98.5 and 105 m range and 149 to 163 m rotor diameter** ranges in GSI mapped cutover peats and adjacent to a flood zone is complex and requires a full engineering lift study.
- b. When erecting a large wind turbine in a challenging site (wetland, flood-zone) you must account for:
 - The crane capacity (lift weight + reach) and corresponding ballast/counterweight.
 - Ground support / crane hardstanding and pad design (especially for soft or wet ground).
 - Water/flood risk, settlement, high water table, reduced bearing capacity.
 - Wind loads during erection (significant for tall hub height & large rotor).
 - Transport, crane mobilisation, boom length, luffing or fixed jib, outrigger spread.
 - Safety factors, crane manufacturer load charts, method statements, lifting plans.
- c. Main Lifting cranes can have a lifting capacity of up to 850 tonnes and a tail crane up to 500 tonnes.
- d. The ground pressure under a crane lifting a tower up to 100m, "Every square metre under the heavy crawler chains must be able to withstand a ground pressure of 26 tonnes." theconstructionindex.co.uk
- e. For each of the 11 turbines proposed for the Ballincor Wind Farm a crane of higher higher-capacity range would be required (up to 1000tonne) class cranes depending on component weights and reach).
- f. In a Flood Zone, additional measures are required:
 - Ground bearing capacity will be lower, so you may need piled support, mats, heavier crane pad substructure, larger footprint.
 - Hardstanding for the crane likely needs thicker crushed stone, possibly geotextile, maybe timber/steel mats to distribute loads.
 - The crane's outriggers and tracks (if crawler) will impose high ground pressure; you must check ground pressure limits of the site.
 - Flood risk means you must ensure crane set-up does not risk stability if water rises or softens ground.
 - The lift plan must assume possible higher wind/gust profiles due to exposure in open wetland.

The facts of how crane and ballast weights will impact the drainage systems are not assessed and the omissions presents a health hazard and risk to the public and the WFD's Objectives for waterbodies in the catchment. The inspector and An Commisiun are requested to investigate and provide detail in their reporting and discussions/voting on this matter.

With respect to the likely loss of flood plain in the proposed Ballinlee Turbine Farm, because the effects have been not considered **in respect of the LOADS placed upon the construction pads and access haul routes**, there is no scientific evidence or mathematical detail to support the conclusions in relation to flood or loss of flood plain. As is the case with most renewable energy projects, the FRA is SITE SPECIFIC in the sense **that it considers risk posed to their own infrastructure and they do not categorically assess flood risk to the Conservation Objective Sharavogue SAC site adjacent.**

6.0 Ireland's History of Impact Assessment Failure

Meenbog Wind Farm is just one example of the significant damage that can result from EIAR assertions that are not grounded in logic. The Meenbog Wind Farm's EIAR concluded 'No Potential for Impact' but this was proven incorrect when the land did slide in November 2020 and there was both water impact and habitat destruction requiring Donegal County Council to secure an order prohibiting further works at Meenbog wind farm (Irish Times, April 2024; Donegal Daily, 12th April, 2024). Photographs of the scale of the real risk again presented here for the lands bounded the Little Brosna River and connected to the Sharavogue Bog SAC. There are comparative areas of peat, forestry and Conservation Objective Site's impact potential.



Plate C Previously concluded 'No Potential for Impact' Meenbog Wind Farm site, which failed in in 2020. (Photo credit Donegal Daily 12th April 2024).



Plate D Previously concluded 'No Potential for Impact' Meenbog Wind Farm site, which failed in in 2020. (photo credit Donegal Live 4th January 2024).

With specific reference to the evidence of peat failure and watercourse impact shown in Plate C and Plate D, the assessments completed and reported for that Meenbog Wind Farm are available for review at <https://www.pleanala.ie/en-ie/case/300460> and comparison with the information before them now. In 2018 the Board accepted a conclusion in the EIAR (2017)'s Lands, Soils and Geology Chapter that ***"No significant impacts on the soil and geology of the site of proposed development will occur."*** and qualifications that ***"A peat stability assessment undertaken for the site shows that the risk of peat failure is designated trivial and tolerable and that the site has an acceptable margin of safety."*** Yet, there was a failure. In the Board's 'Reasons and Considerations'

supporting a Grant of Permission for Meenbog Windfarm the opening statement is that *"Having regard to: (a) the national targets for renewable energy contribution of 40% gross electricity consumption by 2020...."*. However, Mr. Justice Holland is reported by the Irish Times (11th April, 2024) as ruling that *"the integrity of the planning and environmental law systems "weighs heaviest" in this case of all the factors in play and favour granting the injunction. He did not see that the "undoubted public interest in wind energy" weighs "much at all" in favour of exercising his discretion against making the order.* [Hydro-G provides clarification that Mr. Justice Holland has restrained the developers from finishing their "largely complete" 19-turbine project.] Mr Justice Holland said the developers submitted a report of a civil and environmental engineering expert to the EPA estimating that in the November 2020 incident about 86,240m³ of peat slid, of which about 65,740m³ entered a river and ended up on nearby European-protected sites, "causing significant environmental damage". Hydro-G offers that the Meenbog Windfarm slide of 86,240m³ of peat equates to destroying a carbon sequestration asset equivalent to 14.8 million kgs of CO₂ emissions. [Source: National Trust for Scotland, 2024, provides that 172 kg of CO₂eq is contained in each m³ of peat].

It is usual for the EIARs for Wind Turbine plantations to state that IF the project is constructed and operated in accordance with the design, best practice and mitigation that is described within the application's documents, then significant individual or cumulative effects on ecology are not anticipated at the international, national, county, or local scales or on any of the identified Key Environmental Receptors. **Hydro-G** offers that that Conclusion is at odds with recent experiences in Meenbog and also contrary to the most recent Case Law in Ireland stating that one cannot rely on Best Construction Practices and mitigation to protect Conservation Sites.

7.0 Maladaptation

Maladaptation refers to actions or strategies that, while intended to address the challenges posed by climate change, inadvertently exacerbate the problem, or create new vulnerabilities. This can occur when adaptation measures are poorly planned, misaligned with the local conditions, or fail to account for long-term consequences. The Ireland National Adaptation Framework – National Adaptation Plan 2025 (NAP 2025) published by United Nations Framework Convention on Climate Change (UNFCCC) requires, as follows:

- p.42, "Avoiding Maladaptation: Ensure that adaptation actions do not inadvertently create new vulnerabilities or exacerbate existing ones."
- "Consideration of Climate Mitigation: Ensure that climate mitigation outcomes are considered alongside adaptation planning where appropriate."
- p. 47, As part of its annual review, the CCAC also considers developments made in terms of supporting a just transition in terms of both mitigation and adaptation – noting in its 2023 review the need to accelerate the integration of the just transition principles across all mitigation and adaptation policy development and implementation".

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In the case of the proposed Ballincor Wind Farm, Cut over peatland that is already in conservation adjoins the proposed development area (namely Sharavogue Bog SAC), peat excavation is proposed in a flood zone that will exacerbate losses of Carbon Sequestration, tree felling and hedgerow destruction is proposed resulting in Biodiversity loss, widening of roads, construction of roads and 90 BESS containers shipped to and stored on site. It is difficult to understand why one would propose destroying lands that could be transformed in the exact same way as Sharavogue Bog SAC, whose conservation journey began in our lifetime.

Whilst there are biodiversity 'compensation' measures presented to An Comisiún Pleanála, this concept is assessed by academics (Damiens et al., 2021) as ***"At worst, current approaches to offsetting participate in a false promise, which distracts institutional efforts from much needed transformative change centred on renouncing impactful projects, considering a greater range of alternatives, and a greater emphasis on avoidance in the mitigation hierarchy."***

8.0 Impossible EIA

With specific reference to An Coimisiún Pleanála's statutory obligation to complete the EIA, it is hereby advised that there are errors or omissions in the EIAR relating to information in the Water Chapter, the Lands, Soils & Geology Chapter, the Flood Risk Assessment and the AA Screening & NIS. It is respectfully requested that An Coimisiún Pleanála consider whether the Obligations of the EIA Directive 2011/92/EU, as amended by Directive 2014/52/EU, can be met with the information before us. Substantial lacunae include, but are not limited to, the following:

- (1) Overall, not all Environmental Assessments should be written up as EIARs and submitted to competent authorities. The site is simply not suitable on many levels: inappropriate roads, flooding, WFD Poor Status & At Risk issues related to peat drainage when more effect on peat is proposed, Conservation Objective site proximity and hydraulic connectivity, not zoned and many other reasons.
- (2) On a hydrological basis, the proposed development site is hydrologically connected to the Sharavogue Bog SAC. The proposed development site is the same type of subsoil to the Sharavogue Bog SAC and the Little Brosna River is like a spine, or 'back bone' supporting both the SAC and the proposed development site.
- (3) There is a hydrologically and hydrogeologically significant pocket of gravels and an Esker within the lands proposed for development, although a circle has been drawn to exclude it from the Red Line application area. When one has a situation where GSI mapping for 'cut over peat' is on both sides of a river, underlain by Alluvium, and there is a random pocket of gravels with a tail-spur of an Esker emerging from those gravels, one MUST assess the significance with respect to negative impact from Excessive Load construction on the surrounding lands. Does this Gravel hold a key to a connection to the Sharavogue Bog SAC? What is the function of the Esker? How will compressive 'Excessive Load' weights associated with Turbine sites T1, T2, T3 and T4 interact with the Gravels and Eskers excluded from the applicant's 'Red Line' development area? It is not only about 'loss of storage'. It is about weights and the compressive forces associated with Cranes lifting Turbine masts, in 3 pieces for each mast, and 3 rotor blades for each Turbine.
- (4) The lands are 'Benefiting Lands' as per the Arterial Drainage Act and An Coimisiún Pleanála are asked to consult directly with the OPW in this regard.
- (5) Four of the proposed 11 Turbine locations are in lands that do flood now (Turbines 1, 2, 8 and 9). The development has all classes of Flood Zones A, B, C within it. An Coimisiún Pleanála are asked to specifically address the issue of maladaptation in their reporting of consideration of the case.

9.0 Reasons for Refusal

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Some but not all of the Reasons for Refusal directly related to water, flooding and the linked Conservation Objective site are outlined, as follows

- a. Refusal is warranted on the basis that there is too much understatement of Risk with respect to the Impact Assessment and the direct hydrological and hydrogeological link with the Sharavogue SAC is not correctly acknowledged.
- b. With respect to the obligations on the State with respect to the WFD, the EPA reports Poor Status (2019-2024) of the Little Brosna River (Little Brosna_040) bounding the development site and 3rd Cycle 'At Risk' (EPA, 2024). One of the 'Significant Pressures reported in EPA (2024) 3rd Cycle report for the Hydrometric Area is 'Peat Extraction and Drainage'. Given that the proposed development proposes more of this pressure, an Article 4 determination of no potential to impede the Objectives of the WFD cannot be concluded. The applicant has expressly waived both derogation pathways that would otherwise provide flexibility in this assessment. The WFD Assessment (Appendix 9-1, p.28) states that "the proposed project is compliant with WFD and therefore does not require assessment under Article 4.7"; the NIS (p.4) states that "the project proponent places no reliance upon" Article 6(4) IROPI. Full, unqualified compliance with Article 4(1)(a) WFD and Article 6(3) of the Habitats Directive must therefore be demonstrated on the basis of the application as submitted. EU case law requires that NO REASONABLE scientific doubt applies, it requires pre-consent certainty. The detail in the EIAR and associated Appendices has shown how that is not possible. Construction of T1-T9 creates a real and unquantified risk of further deterioration, which is legally impermissible under Directive 2000/60/EC and CJEU Case C-461/13 (Weser).
- c. Refusal is warranted on the grounds that the applicant has not correctly applied the principles of the requisite 'Consideration of Alternatives' requirement of the EIA Directive. For example, Section 4.2 of the Flood Risk Assessment states that "1. The site has not been zoned as part of the Offaly or Tipperary County Development Plans (2021 – 2027 and 2022-2028 respectively), however a comprehensive site selection process considering land ownership and environmental limitations identified this area as the most suitable location for the wind farm". Hydro-G advises that it is interesting to note that the

language used is careful to state that **"a comprehensive site selection process considering land ownership and environmental limitations identified this area as the most suitable location for the wind farm"**. It is not stated that the site IS SUITABLE. It is stated that on the basis of who owned land and who would engage with the developer and 'environmental limitations' identified the area as THE MOST SUITABLE. This means **relatively**, i.e., the site is relatively most suitable. But by whose measure? Cut over peatland that is already in conservation adjoins the proposed development area (namely Sharavogue Bog SAC), peat excavation is proposed in a flood zone that will exacerbate losses of Carbon Sequestration, tree felling and hedgerow destruction is proposed resulting in Biodiversity loss, widening of roads, construction of roads and 90 BESS containers shipped to and stored on site. It is difficult to understand why one would propose destroying lands that could be transformed in the exact same way as Sharavogue Bog SAC, whose conservation journey began in 1990, which is c. 35 years ago. Therefore, for the same lifetime proposed for this private energy endeavour, a restoration project could be successful with better carbon gains.

- d. Flooding: Turbines T1, T2, T8 and T9 are 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. 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.
- e. Site Investigation information presented does not support the access roads and Turbine locations proposed.
- f. No amount of 'mitigation' text can outweigh the concept of 'avoidance of risk' which is a key tenet of the Construction Regulations. The Sharavogue Bog SAC shares the same Little River Brosna 'back bone' as the lands proposed for the private energy enterprise. The hydrological link is unquestionable. The Risks are too high and the Mitigation Measures indefensible. There are unacceptable uncertainties with respect to residual risks and land stability, risks of failure and the potential for the proposed Wind Farm's enabling works to interfere with water dependent Designated Sites with Conservation Objectives.

An Coimisiún Pleanála is requested to refuse permission to the proposed development on many grounds, some detailed by other experts for the local residents and some presented by experts commissioned by local residents in their new endeavour of 'citizen science'.

Pamela Bartley

Signed: _____

Date: 24th June 2026

Dr. Pamela Bartley BEng, MSc, PhD

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Appendix A

Scientific Publications Relevant to the Assessment

- (a) Locke *et al.*, (2026) opens with “Human activities are driving a global decline in biodiversity and are interfering with the natural processes essential for human well-being. Achieving climate and development goals is impossible without keeping nature intact. In this article, we establish the urgent need for a paradigm shift toward a “Nature Positive” (NP) future, where the health and resilience of the Earth system are recognized as the fundamental basis for human prosperity. This requires that humanity acts to halt and reverse the loss of nature by 2030.” The same paper closes with “It is time for us to recognize that nature is the foundation of all human affairs. Unless we act swiftly to make the world NP by 2030, our lives are likely to become very difficult in a destabilized Anthropocene.
- o Hydro-G offers that the European Union (2024) Regulation Of The European Parliament And Of The Council on Nature Restoration and amending Regulation (EU) 2022/869 sets out on the path towards attempting to achieve restoration.
- (b) Damiens *et al.*, (2021) opens with “Economic development is increasingly impacting biodiversity, leading to a rise in biodiversity offset policies globally that aim to compensate for biodiversity losses. Many developments generating offsets create long-term, irreversible losses of biodiversity and, therefore, require biodiversity gains from offsets to be retained over the long term to have any hope of achieving “no net loss” (NNL) of biodiversity. This raises important ecological and institutional challenges that current offset mechanisms, built for politico-economic systems with short-term policy horizons, do not sufficiently consider. We explore this issue and discuss several responses to the problem ranging from incremental changes for improving on-ground management, through to major governance shifts required to support the long-term social-ecological resilience of offset sites. We argue that without these changes, at best, NNL policies participate in temporarily reducing permanent biodiversity loss. At worst, they participate in a false promise, distracting institutions from the transformative changes needed to reverse biodiversity depletion”.
- o Hydro-G offers that it has recently well covered in the Irish media that since 2022 none of the renewable energy MWs have been used to assist citizens in reducing their use of fossil fuels. No Climate Action has been achieved. Instead, Ireland is cited as a ‘cautionary tale’ by the UN in the context of every single MW of renewable energy been given to new industry, thereby countering Climate Objectives.
- (c) Habib *et al.* (2024) in Trinity College, Dublin, research opens with “Ireland has > 50% of the EU’s ocean-raised bogs; however, degradation through land-use activities has transformed them from carbon (C) sinks to sources. Given their significant role in climate mitigation, it is essential to quantify the emissions resulting from land use degradation of these ecosystems”. They developed a mapping system “using Sentinel-2 imagery, random forest machine learning and Google Earth Engine” and their results are fascinating and are summarised as follows: “The results revealed that agricultural grassland comprised 43% of the land use on raised bogs, followed by, forestry (21%), cutover (11%), cutaway (10%) remnant peatlands (13%), waterbodies and built-up ~ 1% each. The overall accuracy of the map was 89%. The map was used to estimate CO₂ emissions for four classes constituting 85% of raised bogs: cutover, cutaway, grassland, and forestry using the IPCC wetlands supplement and literature-based emission factors, we estimated emissions at ~ 1.92 (± 1.58–2.27 Mt CO₂-C-yr⁻¹) and ~ 0.68 Mt CO₂-C-yr⁻¹ (± 0.44–0.91 Mt CO₂-C-yr⁻¹) respectively. This is the first study to spatially quantify land use and related emissions from raised bogs. The results have revealed widespread degradation of these globally rare habitats, making them net emitters of CO₂. The map is vital for the conservation of these ecosystems through restoration efforts, and the methodology can also be applied to other regions with similar peatland land use issues”.
- o Hydro-G offers that the science is abundantly reported and all points to the importance of restoring peatlands such as the areas around the proposed development. It is not enough anymore to greenwash renewable energy. Construction sites with large machinery that will enable turbines to rotate and change air patterns resulting in ‘wake’ is something that has previously been presented to An Commisiun in many other Observations relating to Wind Farm proposals.



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Nature Positive: halting and reversing biodiversity loss toward restoring Earth system stability

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Abstract

Human activities are driving a global decline in biodiversity and are interfering with the natural processes essential for human well-being. Achieving climate and development goals is impossible without keeping nature intact. In this article, we establish the urgent need for a paradigm shift toward a “Nature Positive” (NP) future, where the health and resilience of the Earth system are recognized as the fundamental basis for human prosperity. This requires that humanity acts to halt and reverse the loss of nature by 2030. The Kunming-Montreal Global Biodiversity Framework (GBF) provides a critical roadmap for this NP goal, and global policy increasingly recognizes that environmental targets can only be effective when integrated with global climate, ocean, and human development agreements. This requires a biodiversity conservation approach that accounts for both biotic and abiotic components of the Earth system. We assess the adequacy of GBF targets for stabilizing the Earth system and highlight key gaps. We employ the Three Global Conditions Framework (3Cs), which categorizes landscapes by human impact levels as a practical method for guiding appropriate NP actions, and we extend its application to the marine realm. We outline specific actions and metrics for patterns and processes across all scales needed to achieve biodiversity conservation in synergy with climate stabilization and securing freshwater systems. Our findings emphasize that preventing the loss of intact biomes, ecosystems, and species assemblages is the most critical strategy while acknowledging the urgency of extinction prevention and the need for restoration. Additionally, we highlight the importance of incorporating

Indigenous and local knowledge systems alongside scientific methods to achieve effective and equitable conservation outcomes. Finally, we discuss the need for economic transformation and the private sector's role in fostering an NP future.

KEYWORDS

biodiversity, climate change, Global Biodiversity Framework, Nature Positive, planetary boundaries, Sustainable Development Goals, Three Conditions Framework, indigenous and traditional knowledge

Key points

- Stabilizing the biophysical components of the Earth system requires a unified “Nature Positive” (NP) approach to global environmental goals and governance through greater integration of global agreements for human development, the climate, biodiversity, and the ocean.
- To achieve the NP goal by 2030, the top priority should be preventing the loss of intact biomes, ecosystems, natural processes, and species assemblages, as they are irreplaceable and cannot be quickly restored. At the same time, urgent efforts to prevent species extinction and restore nature remain essential.
- Three Global Conditions Framework (3Cs) serves as a strategic approach to halt and reverse the loss of both the processes (biotic and abiotic) and patterns (species distribution and assembly) of biodiversity, as these are integral components of the Earth system, and to ensure their sustainable use.
- Incorporating Indigenous or traditional knowledge and practices, which are rooted in responsibility to the living world and inherently include awareness of biotic and abiotic processes, is essential to achieving the NP goal.
- The NP shift requires transforming our economic system to work within the Earth system and equitably support human development.

among island species (6). At the ecosystem scale, 54% of the world's ecoregions are severely degraded, with an additional 25% undergoing further degradation, leaving only a quarter largely intact (7, 8).

Natural processes, which encompass both biotic and abiotic interactions across ecosystem, biome, continental, and planetary scales, are also under threat. Migration, a key biotic process essential for maintaining ecosystem health and structure (9), is increasingly imperiled across terrestrial, freshwater, and marine environments. Alarming, 44% of species tracked by the Convention on Migratory Species (CMS) are in serious decline, with 97% of listed migratory fish species facing extinction (10). Similarly, biotic and abiotic interactions, also known as biophysical processes (11), are threatened. For example, running freshwater systems, such as springs, streams, and rivers, are critical biophysical processes that sustain the health of both terrestrial and aquatic ecosystems, yet only 30% of river systems worldwide remain free flowing (Box 1) (12). Excessive nutrient run-off from terrestrial sources has created anoxic “dead zones” in estuaries downstream from the world's most densely inhabited areas (13).

At the biome and continental scales, rainfall processes that involve moisture recycling in rainforests are also at risk, with potentially disastrous consequences for species, the climate, and food security (Box 2). At the planetary scale, ocean warming (14–18), acidification (19, 20), and deoxygenation (17, 21) are altering marine ecosystems. These changes are driving mass coral die-offs due to marine heat waves (22–24), weakening the shells of marine organisms due to acidification (25, 26), and threatening marine foundation species (23).

Human-caused species extinction, damaged and collapsed ecosystems, and disrupted natural processes are not only factors of an ecological crisis but also an ethical failure with profound consequences for human health. Biodiversity loss is linked to the emergence and spread of infectious diseases in humans, animals, and plants (27). Declines in species diversity can increase the number of zoonotic disease-carrying species (28), while ecosystem disruption, such as forest loss, degradation, and fragmentation (29), elevates the likelihood of pathogen spillover from stressed wildlife to humans directly (30) or to livestock and then on to humans, as happened with Hendra virus (31). Ecological disruptions have already contributed to outbreaks of deadly diseases, including Ebola, Marburg, and mpox (32, 33). Climate change further exacerbates these risks, intensifying 58% of the 375 known infectious diseases (34, 35).

Zoonotic disease spillover to humans is an ecological process and therefore an ecological problem (33). Despite mounting

Introduction

Human exploitation of nature driven by prevailing economic systems of production and consumption is causing a rapid and catastrophic decline in biodiversity (1) while simultaneously disrupting the climate system (2). These actions are actively destabilizing the Earth system upon which human health and development depend (3), and the trajectory of environmental degradation is accelerating, placing life as we know it at grave risk.

Biodiversity loss occurs at three interconnected scales—species, ecosystems, and natural processes—all of which affect Earth system stability. At the species scale, 48% of vertebrate and insect species are in decline, with only 49% remaining stable and 3% increasing (4). Within individual species, genetic diversity is also in decline (5): globally, 6% of species are losing genetic diversity, rising to 24%

BOX 1 Hydrological systems are critical to a Nature Positive future

Preserving and restoring freshwater hydrological systems and habitats is crucial for achieving the “Nature Positive” (NP) goal, the Sustainable Development Goals (SDGs), and climate change objectives.

River systems (especially in tropical and boreal environments) are rich in methane, a potent greenhouse gas, and account for a substantial portion of methane emissions. Disturbing river hydrology releases methane into the atmosphere, with 10% of all global freshwater methane emissions resulting from dams (36). Conversely, maintaining and restoring hydrological processes reduces methane emissions (37).

Another example is peatlands, vital carbon and water reservoirs that depend on intact hydrology. Tropical peatlands store more carbon than upland forests (38), while those in the Northern Hemisphere are spatially more extensive (39). Peatlands release carbon when drained, whether through peat mining or infrastructure projects such as roads, dams, and water diversions (40, 41). Protecting intact peatlands and their hydrological functions is crucial for maintaining their carbon storage capacity and preventing them from becoming carbon sources (42, 43). Rewatering degraded peatlands can serve as a climate mitigation strategy, although its benefits are better understood for northern than tropical peatlands (44). High-elevation peatlands in the Andes (páramos or bofedales) are also essential for water supply in Andean nations (45).

Generally, the deleterious effects of dams are well understood. The Columbia River Basin of North America, with over 40 hydroelectric dams, has seen the near collapse of enormous salmon populations, once numbering up to 100 million returns annually. Functional hydrology is also critical to estuary ecosystems. Mangrove conservation and restoration provide effective nature-based solutions to the climate crisis, as mangroves sequester significant amounts of carbon relative to their area and offer critical shoreline protection and food security (46–48). These ecosystems rely on sediment-bearing freshwater inputs, which are threatened by upstream dams. For example, mangroves in Mexico died off following the construction of dams upstream, whereas those in nearby free-flowing rivers thrived (49). Similarly, hydrological alterations in the Mississippi River delta have caused catastrophic mangrove loss (50, 51).

Therefore, hydroelectric dam removal is a powerful NP action. In the United States, the removal of two hydroelectric dams on the Elwha River has led to rapid ecological recovery, benefiting both marine and terrestrial species (52, 53). Likewise, the removal of four dams in the Klamath River system resulted in salmon returning within 2 weeks (54, 55). In an NP world, more dams would be removed, and new dam proposals would need to undergo a “nature veto”, proving they would not harm ecological integrity.

BOX 2 Tropical rainforests—vital Nature Positive actions at the biome level

Maintaining and restoring tropical rainforests of the Amazon, Congo Basin, and Southeast Asia regions is critical to “Nature Positive” (NP) actions owing to their roles in carbon sequestration and storage and the enormous number of species they harbor. The first two also play a vital role in rain generation at the continental scale.

Amazonian rainforest generates a significant part of its own rainfall through moisture recycling (56), but estimates suggest this only occurs if the overall forest cover is 75–80% intact (57). The Amazon Basin is already about 17% deforested (58) and under pressure from global warming (59). Its irreversible transition into savannah-like vegetation would greatly affect rainfall patterns and persistence of the remaining forest and the species it supports (60), as well as the global climate (61).

Modeling indicates that losses of 23% forest cover would put these tropical forest biomes at risk of massive disruption, with potential disastrous effects on agriculture outside their basins (62–65). The Amazon provides rain to the La Plata Basin, the most productive agricultural area in South America (66), and as far away as Texas (67). Loss of this rainfall potentially threatens large-scale food security. Forest cover in the Congo Basin (65) also generates spring rains, with 80% of the atmospheric moisture coming from the transpiration of plants (68). This Central African rainforest is also a major source of rainfall to parts of East Africa (63). Moreover, the Congo is much drier than the Amazon and has larger peatlands—drying of Congo peatlands could the release of a vast amount of stored carbon into the atmosphere (69).

These are more than theoretical concerns. The much-degraded southeastern Amazon has already become a carbon source to the atmosphere (70), and at its southern edge, loss of 55% of the forest is causing nearby agricultural losses due to reduced rainfall (64). According to a recent assessment, human-caused changes in 40% of the Amazon rainforest have moved that part of the system to a bifurcation point where it could exist either as rainforest or savannah (71).

evidence that preserving and restoring nature is the most cost-effective and equitable means of preventing zoonotic spillover (72–74), current public health strategies prioritize biomedical interventions over ecological prevention measures (73). Additionally, the degradation of natural systems has serious mental health consequences, contributing to eco-anxiety among the general population (75, 76) and negatively impacting Indigenous communities whose cultural and spiritual well-being is deeply tied to their environments (77). Conversely, access to nature improves physiological, mental, and cognitive health (78). Recognizing these interconnections, over 200 medical journals jointly called on world leaders and health professionals to address climate change and biodiversity loss as a single, indivisible crisis that must be tackled together to preserve human health and avoid catastrophe (79).

The economic implications of environmental degradation are equally severe. The global economy is embedded in the biosphere (80) and fundamentally dependent on a stable Earth system, which, in turn, is sustained by a healthy biosphere (81). Half of global economic activity, including food production, relies directly on nature (82), and the continuing decline of biodiversity threatens financial stability worldwide (83). The most vulnerable

communities suffer disproportionately when nature’s ability to provide essential services deteriorates (84).

The very conditions that have made modern human civilizations possible are now unraveling. The Holocene Epoch—the stable, warm, interglacial period spanning the past 12,000 years—enabled the rise of sedentary societies and global development. However, since the mid-20th century, human exploitation of the environment has accelerated, ushering in the Anthropocene, an era in which humanity has become the dominant force driving planetary change (85). We are destabilizing critical components of the Earth system, particularly biodiversity and the climate (3, 86, 87). Our ongoing actions have the potential to push the planet into a new self-reinforcing “Hothouse Earth” state (88), rendering the Earth increasingly hostile to human life (88). Our impacts have placed humanity at such risk that the United Nations (UN) Secretary General has called our collective actions “suicidal” (89).

To provide a coherent and hopeful response to the crisis, international environmental, non-governmental, and business organizations issued a call to the 2020 UN General Assembly to establish a “Nature Positive” (NP) global goal for nature (90). This goal was proposed for use by the Convention on Biological

Diversity (CBD) to complement the UN Framework Convention on Climate Change (UNFCCC) Paris Agreement's carbon-neutral "net-zero" target for climate change and the Sustainable Development Goals (SDGs). In April 2021, NP was formally defined as a goal to halt and reverse nature loss by 2030, relative to a 2020 baseline, to ensure full recovery of nature by 2050 (91). The G7 leaders subsequently endorsed NP as a core objective in their 2030 Nature Compact (92).

The Kunming-Montreal Global Biodiversity Framework (GBF) was adopted in December 2022, and it included the NP global goal of halting and reversing biodiversity loss by 2030 on the way to achieving the GBF's vision of restoring a healthy planet and achieving harmony with nature by 2050 (93). However, this, in isolation, is not enough. It is now widely acknowledged that nature conservation and restoration contribute to climate change mitigation and adaptation and that biodiversity and climate objectives must be addressed together (94–96). Notwithstanding the clear connection, international climate and biodiversity treaties have historically operated in isolation (97).

However, parties have now taken steps toward an integrative approach. The 2023 Global Stocktake agreed at the 28th Conference of the Parties (COP28) to the UNFCCC in Dubai (98) recognized the importance of conserving biodiversity in line with the GBF to achieve the Paris Agreement temperature target. Similarly, the GBF's lack of a clear commitment to support climate goals was substantially remedied by the CBD COP16 Cali decision on biodiversity and climate change in 2024 (99). It calls on CBD parties to maximize potential synergies between biodiversity and climate actions, including prioritization of the protection, restoration, and management of ecosystems and species important for the full carbon cycle. Although efforts to agree on a roadmap to halt global deforestation failed at COP30 in Belem (100), there was greater integration of nature at this climate COP than previously. These important developments are a recognition that both treaties operate in the context of the Earth system.

This article is the first to take an interdisciplinary, intercultural, and integrated approach to examining what is needed to achieve the NP goal on land and in freshwater, as well as in the ocean. Specifically, our analysis focuses on:

- Assessing how NP aligns with the SDGs, Paris Agreement, and GBF and discussing how these existing frameworks could contribute to Earth system stabilization.
- Proposing a holistic NP framework and global-scale metrics spanning all aspects of biodiversity (natural processes, ecosystems, and species) using the Three Global Conditions for biodiversity conservation and sustainable use framework and extending it into the marine realm.
- Recommending alignment of GBF, Paris Agreement, and SDG reporting mechanisms.
- Describing an economic transformation that integrates NP principles while ensuring equitable human development.
- Highlighting the importance of the ways of knowing (sometimes called traditional knowledge systems) of Indigenous peoples and local communities to achieving the NP goal.

Nature Positive and Earth system stability: Sustainable Development Goals, Global Biodiversity Framework, and planetary boundaries

Human development and climate goals cannot be met without a healthy, diverse, and resilient natural world. This section explores these interdependencies and clarifies how the NP global goal aligns with key international development and climate instruments, identifies gaps, and provides a foundation for a more integrated approach to achieve an equitable, nature-positive, and carbon-neutral world.

Nature Positive and the Sustainable Development Goals

The SDGs are a set of biophysical, social, and economic normative goals that seek to end poverty, protect the planet, and ensure peace and prosperity for all by 2030 (101). They have been described as universal, interconnected, and inseparable and are of equal importance, balancing the economic, social, and environmental dimensions of sustainable development (102). Thus, economic goals such as promoting inclusive and sustainable economic growth, employment, and decent work for all (SDG 8) and building resilient infrastructure, promoting sustainable industrialization, and fostering innovation (SDG 9) are placed on equal footing with fundamental human survival needs like food security (SDG 2) and access to clean water and sanitation (SDG 6) as well as environmental imperatives such as climate stability and maintaining life on land and in water (SDG 13, 14, and 15).

When social, economic, and environmental goals are expressed as equal and competing, the SDGs are viewed as seeking the "sweet spot" where they overlap and converge (Figure 1, left side). Fundamentally, this is a conceptual failure: the SDGs may be of equal importance politically, but they are not so in reality.

The Earth system existed for billions of years before humans emerged. Human life, and thus all human development goals, are wholly dependent on the Earth system operating in a way that is favorable to humanity. The various SDGs are simply not of equal importance: those that support the Earth system underpin all human activity (SDG 13, 14 and 15), and humans cannot exist without a conducive Earth system that creates food and water (SDG 2 and 6); the economy was invented by and cannot exist without humans—it cannot thrive unless human society has food, water, health, institutions, and skills sufficient enough to support it (103–105).

Therefore, a more accurate framework acknowledges a hierarchical relationship in which the environment forms the foundation for human society, and the economy exists as a subset of society that must serve human interests (106–108), as illustrated in Figure 1, right side. This perspective aligns with early sustainable development principles that recognized biodiversity, ecosystems, and natural processes as an indispensable prerequisite to sustainable development (103). Addressing the SDGs in that light is now more urgent than ever. The NP paradigm embodies this conceptual shift.

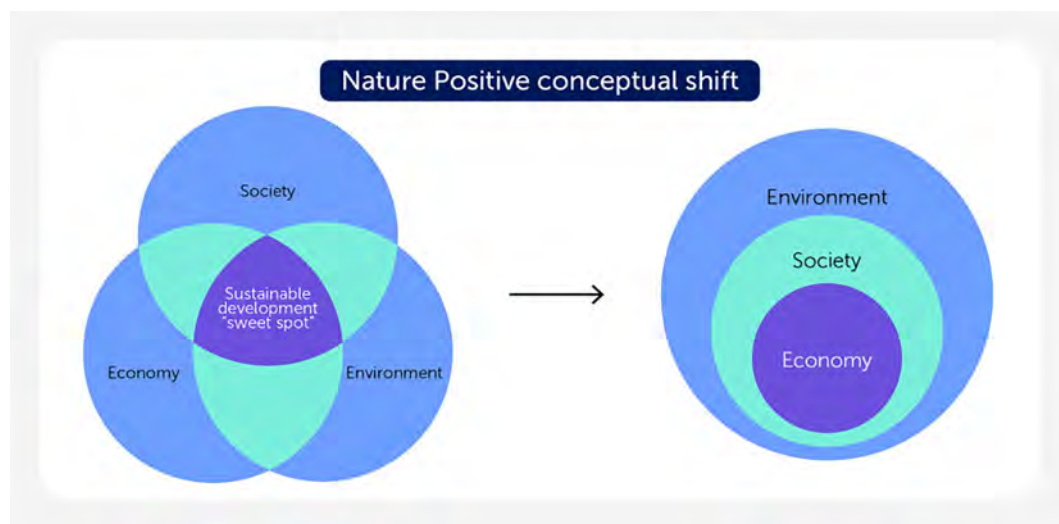


FIGURE 1

"Nature Positive" (NP) involves a conceptual shift from viewing the environment as a competing interest with society and the economy to recognizing it as the context for all human activity. This shift realigns the Sustainable Development Goals (SDGs), moving from the search for the "sweet spot" of overlap between the environment, society, and the economy (left side) to a hierarchical relationship in which the environment is recognized as the context for all aspects of human existence and the economy is understood as a subset of society, existing solely to serve human interests (right side).

Nature Positive and Earth system science

The Earth system comprises the atmosphere, hydrosphere (including the cryosphere), geosphere, and biosphere. The biosphere emerges from interactions among the other three spheres and, in turn, influences them. These feedback mechanisms regulate planetary resilience by buffering stress and shocks (i.e., solar radiative forcing and volcanic eruptions), thereby maintaining equilibrium. The most recent equilibrium state, the Holocene epoch, allowed sedentary civilizations to develop and large human populations to flourish (Figure 2A).

This stable state, however, is now threatened by global human pressures on the Earth system, ushering in the Anthropocene (109). We see more frequent and intensified extreme events (e.g., droughts, floods, heat waves, fires, and disease outbreaks), while we are gradually eroding the biosphere of its life-support capacity, pushing Earth system boundaries toward multiple tipping points (59). Sixteen biophysical and climate tipping points have been identified where self-reinforcing feedback loops threaten to drive irreversible state shifts, ultimately altering the state of the entire planet (Figure 2B) (59). Examples include the transformation of rainforests into savannah-like landscapes due to moisture loss (Box 2), the rapid melting of the Greenland Ice Sheet, and the collapse of tropical coral reef systems.

The Planetary Boundaries Framework emerged from understanding Anthropocene pressures, the risks of crossing tipping points, and the evidence that nature is a precondition for a stable Earth system (110, 111). Nine planetary boundaries that regulate the function and stability of the Earth system have been identified. Humanity's actions have now transgressed seven of them, namely the two core boundaries of biodiversity and climate, together with those for land system change, altered biogeochemical cycles for

nitrogen and phosphorus, freshwater change, changes to both blue water (runoff water) and green water (soil moisture), novel entities [human-created chemical compounds, e.g. per- and poly-fluoroalkyl substances (PFAS), persistent organic pollutants (POPs), and microplastics] (3), and, most recently, ocean acidification (112). These crossed boundaries indicate that the Earth is losing resilience and is in a state of internal stress unprecedented in human history (113). In addition, control variables exist but have not yet been quantified for high-seas deoxygenation and ocean heat absorption, which are further exacerbating instability. The Planetary Boundaries Framework is a diagnostic tool providing a dashboard for a safe operating space for humanity on Earth; it does not, however, prescribe solutions or define normative goals (114). NP is the necessary normative goal and pathway derived from Earth systems science that provides a safe landing for humanity within the living biosphere. Combined with carbon emissions reductions, it seeks to return the Earth system to Holocene-like stability by halting the loss of intact nature and transforming nature-negative impacts into nature-positive feedbacks (Figure 2C).

Nature Positive and the Global Biodiversity Framework

The GBF is the primary global agreement that relates to nature and is broadly analogous to the Paris Agreement on climate, although it is not binding in its own right. Both agreements were reached under Rio Framework Conventions (CBD and UNFCCC). The GBF consists of an overarching 2050 vision, an actionable 2030 mission, and specific targets to be achieved by 2030. Its mission is to halt and reverse biodiversity loss by 2030 as a pathway to the 2050 vision of humanity living in harmony with nature, ensuring a healthy planet that provides benefits for all. The GBF promotes cohesiveness and

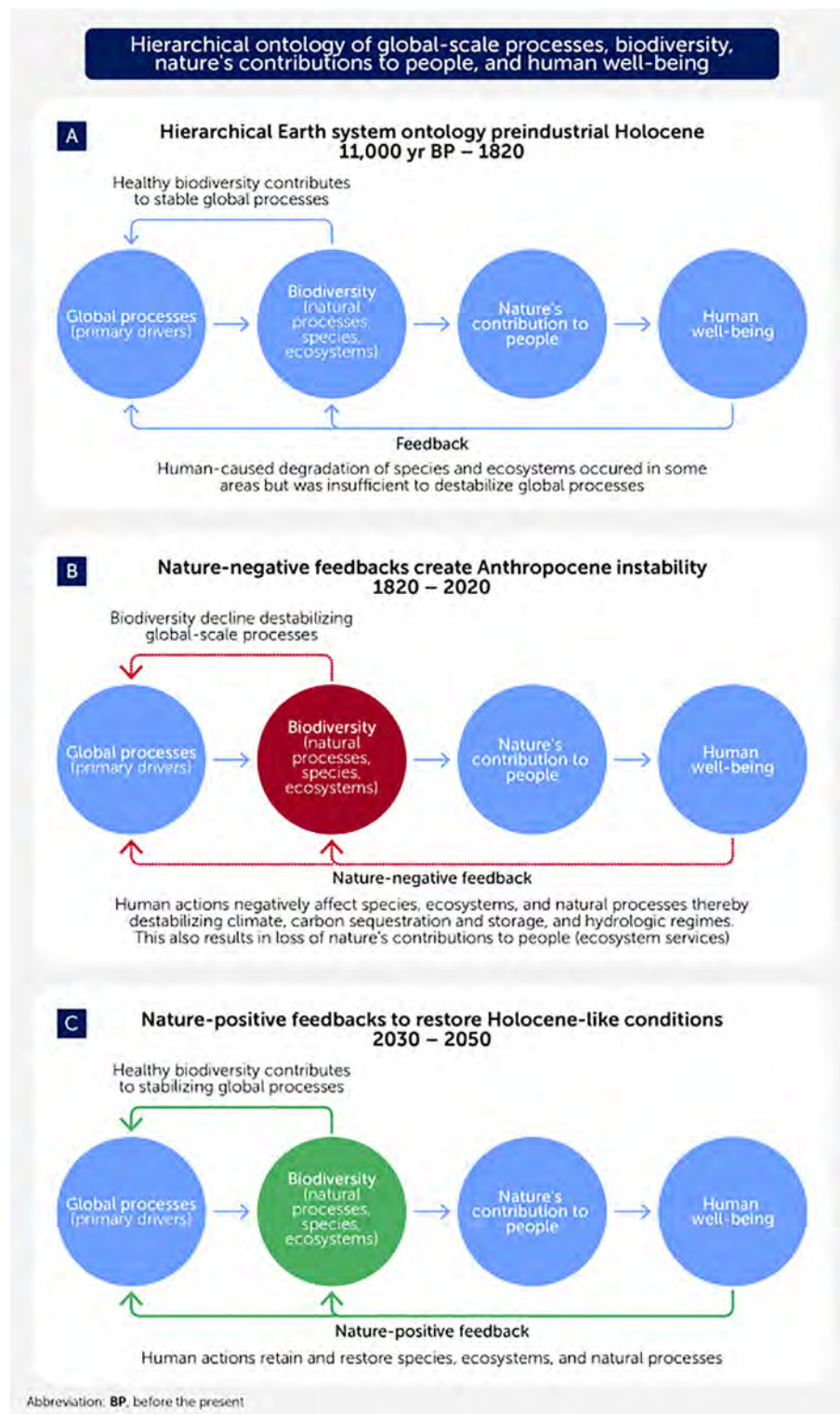


FIGURE 2

Hierarchical ontology of global-scale processes, biodiversity, nature's contributions to people, and human well-being. (A) Holocene conditions; (B) Anthropocene conditions, during which nature-negative human feedbacks destabilize the Earth system; (C) "Nature Positive" actions to halt and reverse biodiversity loss, combined with climate actions to reduce fossil fuel emissions, are needed to restore stable Holocene-like conditions.

complementarity among international agreements (93)¹ and integrates the Rio Declaration on Environment and Development

(93),² which calls for a global partnership to protect and restore the health of the Earth's ecosystem (115). The GBF also calls for

1 Section B, Global Biodiversity Framework.

2 Section C, Global Biodiversity Framework.

alignment with the SDGs (93) and the One Health approach, which recognizes the link between human, animal, and environmental health (116). To achieve the GBF's 2050 vision, Rio Principle 7, and One Health, we must stabilize the Earth system.

GBF implementation is based on a comprehensive framework that includes monitoring, financial resource mobilization, and an agreement on digital sequence information to support shared benefits from the use of genetic resources. While implementation occurs at the national level through the 196 country parties, the GBF also calls on subnational governments, civil society, business, as well as Indigenous and local communities to participate in a whole-of-society approach.

The GBF's mission of halting and reversing biodiversity loss by 2030 is the NP goal in all but name. Its 2050 goals reinforce this alignment: Goal A calls for the integrity, connectivity, and resilience of all ecosystems to be maintained, enhanced, or restored, thereby substantially increasing the area of natural habitat (93). Goal B calls for biodiversity to be sustainably used and ecosystem functions and services to be maintained and restored. Goals C and D address equitable distribution of benefits, increasing financing, and aligning financial flows with the GBF. While the GBF's goals effectively address many aspects of the 2030 mission, its targets are silent on key elements necessary to meet the GBF's mission, vision, and overarching objective of complementarity with other international agreements. The major shortcoming is a lack of attention to natural processes at all scales. Ameliorating this gap does not require amendment of the GBF, but complementary attention by all actors as discussed below.

Another area requiring focused attention is ocean governance, as there is disagreement over whether the GBF covers areas outside of national jurisdiction, which is almost two-thirds of the global ocean. The Agreement on the Conservation and Sustainable Use of Marine Biological Diversity of Areas beyond National Jurisdiction (BBNJ) under the UN Convention on the Law of the Sea (UNCLOS) is a much-needed complement to the GBF. Its general objective is conservation and sustainable use of marine biodiversity, and it creates a framework for marine protected areas (117). Its specific objectives include building resilience to the adverse effects of climate change and ocean acidification and maintaining and restoring ecosystem integrity, including carbon cycling, in order to underpin the role of the ocean in the climate system. If implemented effectively—through measures such as protecting at least 30% of the ocean and ensuring sustainable fishery management—it could contribute significantly toward the development of an NP world (118). Recognizing this, at the Conference of the Parties (COP16) to the Convention on Biological Diversity (CBD), the Parties decided to “explore opportunities for addressing the ocean-climate-biodiversity nexus in an integrated manner”. This integration is urgently required.

Implementing and measuring Nature Positive conservation

In this section, we outline a framework for implementing conservation actions for natural processes, ecosystems, and

species, and we present metrics for measuring progress toward the NP global goal.

The scope of the NP global goal was originally described in 2021 as follows:

Nature-positive includes a focus on species distribution, abundance, functional traits, genetic diversity, and demographic trends as well as the intactness and integrity of ecosystems and biomes. It also includes the functioning of ecological and global processes such as hydrology, rainfall patterns and migration.... Together these provide a resilient planet able to cope with shocks and stresses without crossing destabilizing tipping points.... Connecting the nature-positive goal to equity and carbon neutrality recognizes the fundamental connection between human development and the health of nature and the deep connection between nature, climate and Earth system stability (91).

Here, we explore actions and metrics that address the full scope of the 2021 NP global goal. We note a variety of papers published since 2021 that deal with aspects of NP, including an additional proposed metric focused on staying within nature's carrying capacity (119). Useful approaches to measuring biodiversity in terms of patterns and quantification of genes, species, and ecosystems have also been identified (120). However, both biotic and abiotic natural processes must also be addressed to fully conserve biodiversity and contribute to a stable Earth system. We begin with some general principles.

General principles for Nature Positive actions and metrics

To move toward stabilizing the Earth system, the protection of intact nature is our most urgent goal. By “intact” we mean areas free of significant human-induced degradation, which often occur within the territories of local traditional communities and Indigenous peoples (121), and all remnants of primary ecosystems, whether large or small (122–124). Nature restoration is important but secondary to retaining intact nature because any further losses cannot be restored in the critical time we have left. Although tree planting is widely discussed as a climate solution because trees absorb atmospheric carbon dioxide (125), at the global scale, preserving existing intact ecosystems is far more effective for achieving net-zero emissions by 2050 than large-scale afforestation efforts (126–128). This is because most natural systems, when disturbed, lose a substantial portion of their above- and below-ground carbon stores, requiring decades to centuries to recover, which takes us far beyond the 2050 net-zero target (129). Retaining intact nature also maximizes Earth's resilience, which is crucial because climate pressures are already weakening ecosystems' capacity to absorb carbon (130). Remaining intact natural biomes are also vital for retaining rainfall patterns (Box 2), and healthy ecosystems support more species in greater numbers than degraded ones, resist invasive species, reduce pandemic risk (33, 131), and provide greater ecosystem services, such as clean freshwater.

That said, restoration is a primary and urgent strategy in areas of significant ecological degradation, such as New Zealand/

Aotearoa, Western Europe, many Mediterranean-type ecosystems, and in tropical grasslands and dry forests worldwide (132). Reforestation in tropical areas where forest cover has been reduced can rapidly restore some aspects of ecological function (132, 133). Restoration of species composition can improve ecosystem function and help meet carbon-management goals (134); however, this often takes longer than biomass recovery (135). Importantly, reforestation and afforestation are not necessarily synonymous with ecological restoration (136). A singular focus on tree planting for climate mitigation instead of a thoughtful focus on restoring ecosystem composition and protecting native species risks failing both biodiversity and climate goals (137). In two cases, reducing just one human pressure can result in important improvements in species diversity and populations, ecosystem health, and natural processes: (1) discontinuing fishing in ocean areas with minimal human modification (118, 138, 139) and (2) reducing continuous grazing pressure from domestic animals on grasslands that have not yet undergone phase shifts (140).

Establishing baselines is essential for measuring progress (141). The NP global goal is a net improvement in ecological conditions from a 2020 baseline by 2030. The 2020 baseline was set because that is when the last set of conservation targets under the preceding CBD's Aichi Biodiversity Targets expired, and the new GBF was to be negotiated, before the process was delayed by the COVID-19 pandemic. Achieving the NP goal by 2030 does not require every natural process, ecosystem, or species to have improved by 2030. However, it does require that, in aggregate, human actions across the Three Global Conditions Framework (3Cs) have secured the existing intact nature and that substantial ecological restoration actions are underway, so that nature is in better condition in 2030 than it was a decade earlier.

Here, we apply the 3Cs as a practical approach to achieving both the GBF goals and targets and the necessary complementary NP actions that address natural processes.

The Three Global Conditions Framework for implementing the Global Biodiversity Framework and complementary Nature Positive actions

The GBF's targets for actions to protect, restore and sustainably use biodiversity are as follows: reduce loss of intact areas to near zero (T1); restore 30% of degraded areas (T2) and protect and conserve at least 30% of land, freshwater, and ocean in an interconnected way (T3); reduce species extinction risk and curtail unsustainable use (T4, 5, 6, and 9); reduce pollution (T7); address climate impacts on biodiversity (T8); improve sustainable practices for agriculture, aquaculture, wild fisheries, and forestry (T10); and maintain nature's functions and contributions to people or ecosystem services (T11). While the GBF sets global targets that each party will implement in accordance with its own national circumstances (93), it provides no guidance on which of the many required actions apply most effectively in the highly variable conditions that exist among and within countries. For example,

while half the world has been transformed by human activity, this transformation is unevenly distributed (142).

Nonetheless, the GBF targets and supplemental NP actions addressing natural processes can be implemented systematically by categorizing the world into three "conditions" of human impact: (1) "Large Wild Areas" with very low human impact (termed Condition 3 or C3, approximately 26% of the terrestrial world), (2) "Shared Lands" ranging from slightly to less than half transformed by human activity (termed C2, approximately 55%), and (3) "Cities and Farms" where land is more than half to entirely transformed (C1, approximately 18%) (Figure 3) (143).

The 3Cs framework has been recommended by multiple expert bodies and institutions, including by: the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) and Intergovernmental Panel on Climate Change (IPCC) as an effective approach to integrating climate and nature actions (95, 144); experts engaged by the CBD as an effective approach to implementing GBF targets in an integrated way (145); African scientists as an effective way to integrate biodiversity targets from local to global levels (146); economists as the most cost-effective means of implementing the 30 × 30 protected and conserved areas under GBF T3 (147); the Dutch Central Bank as an efficient way of reconciling conservation, climate, and food security goals (148); and zoonotic disease experts as an effective way of sorting ecological countermeasures to prevent pandemics (30, 33). It has also been recognized as an approach to support governance that achieves co-benefits alongside social, biodiversity, and climate objectives (149).

For too long, the ocean, freshwater, and land have been treated as separate domains, which has resulted in a fragmented approach to an integrated challenge. For example, no discussion of mangrove conservation is complete without addressing freshwater hydrology and sediment transport (49). Similarly, no effort to remedy oxygen-depleted "dead zones" in marine estuaries is of any value unless it examines harmful terrestrial inputs into freshwater systems (13). Similarly, coral reefs can either be adversely affected by sediments and nutrients from anthropogenic causes or enhanced by background levels of natural nutrients from land (150). Further, the rapid changes in ocean temperature, chemistry, currents, ice cover, foundation species, and fish biomass are cause for alarm. We must therefore pay urgent attention to both reducing stressors and increasing conservation measures across the marine realm. In this article, we seek to remedy the artificial separation of ocean, freshwater, and land by extending the 3Cs approach across all three, allowing for a more holistic and integrated approach.

Human impact on the ocean differs from that on land; the 3Cs approach is not directly transferable except in the case of estuaries immediately adjacent to cities and farms, with C1-level physical impacts (151). However, fisheries-related impacts are analogous to habitat loss on land due to bottom trawling and severely reduced large-bodied fish populations (152–154), which have resulted in ecosystem-level impacts (153, 155, 156). Thus, in the marine context, C1 applies not only to estuaries but also to the 12 nautical mile (22.6 km) territorial waters of most countries, which have been extensively modified by human actions but still retain fragments of semi-intact nature. C2 can be applied to the remainder

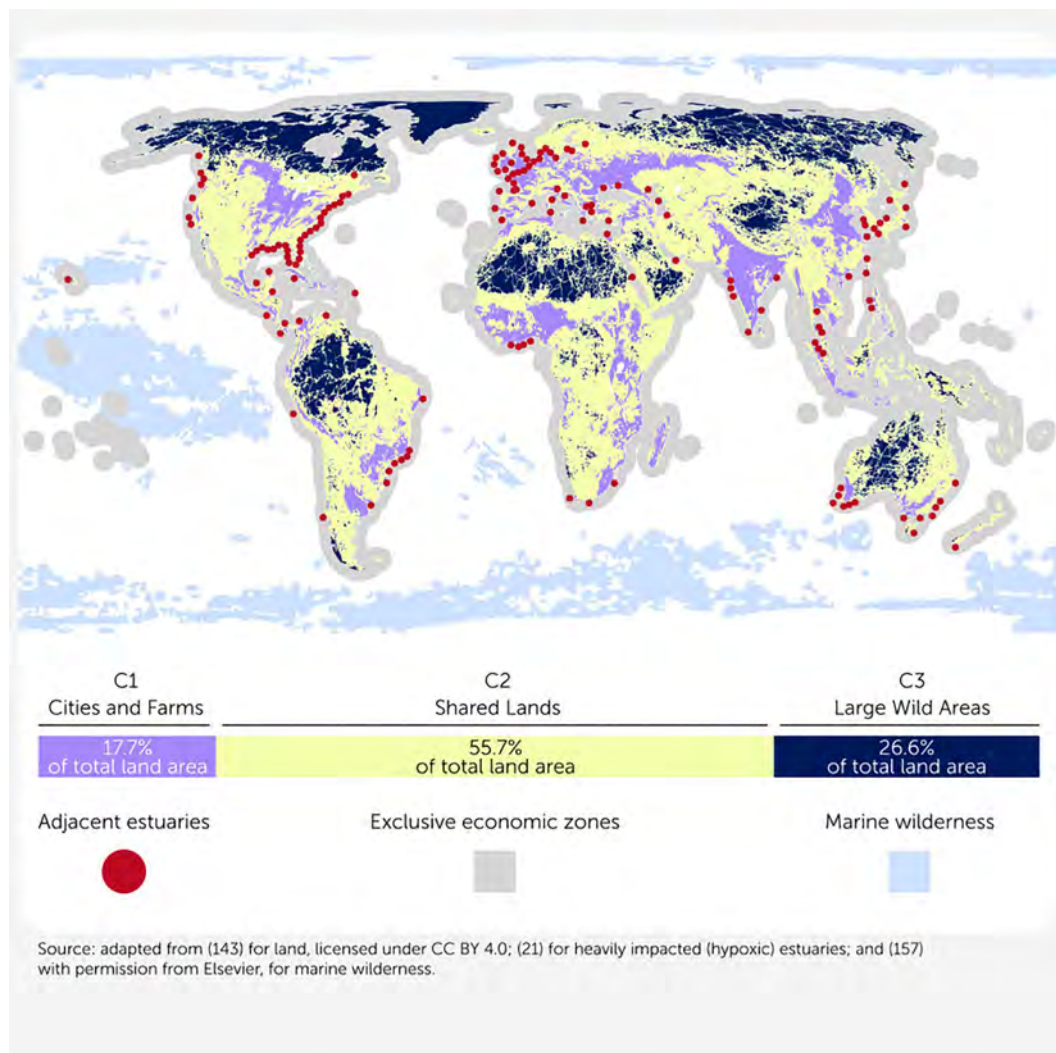


FIGURE 3

The Three Global Conditions Framework (3Cs) for simultaneous conservation and sustainable use strategies applied to land, freshwater, and ocean. Adapted from (143) for land, licensed under CC BY 4.0; (21) for heavily impacted (hypoxic) estuaries; and (157) with permission from Elsevier, for marine wilderness.

of the exclusive economic zones (200 nautical miles) and most of the high seas, where fishing that includes bottom trawling has depleted fish stocks and removed large-bodied fish (152, 155, 158) but where some high-biomass areas with low fishing pressure remain (159). Only the Arctic and Antarctic, which have been protected by large ice sheets, and only the most remote parts of the open ocean (approximately 13%) are “marine wilderness”, a condition analogous to C3 large wild areas on land (157).

The 3Cs framework provides a structured approach for implementing NP actions tailored to the human impacts and resulting ecological and biophysical characteristics of each condition (Figure 3). It is not a prioritization scheme but rather provides coherent points of departure for simultaneous conservation and sustainable-use actions appropriate for each condition, because nature matters everywhere.

Maps of the terrestrial 3Cs for every region and country are found at naturebeyond2020.com. We hope this initial integrative work might stimulate more thorough mapping of the 3Cs in the ocean.

Actions and metrics for natural processes, species, and ecosystems

There are well-known and effective strategies for biodiversity conservation, many of which are found in the GBF. Here, we discuss those actions and metrics necessary to measure progress toward the NP global goal and the GBF’s vision, goals, and targets across the 3Cs. We also identify gaps in the GBF (Table 1).

Large-scale natural processes

Large-scale natural processes relate to the dependence of ecosystems and species upon, and their interactions with, the abiotic component of the Earth system at scales that affect planetary health and functioning. NP actions targeted at species or specific ecosystem types alone are not sufficient to retain overall structure and function. For example, in large intact areas, GBF species and individual ecosystem targets could be met in isolation, but the entire biome could still collapse. This could result in not only the loss

TABLE 1 Global-scale “Nature Positive” (NP) actions and metrics, and their alignment with Global Biodiversity Framework (GBF) goals and targets, applied across the Three Global Conditions Framework (3Cs) using Conservation Imperatives (160), International Union for Conservation of Nature (IUCN) Red List of Threatened Species (161), IUCN STAR Metric (162), IUCN Green Status (163), and Mitigation Hierarchy (123).

Actions		Metrics	Goals and targets
C1 – Cities and Farms	Species level		
	Conservation Imperative sites are secured	All identified <i>Alliance for Zero</i> extinction sites/ Conservation Imperative sites are under effective management to secure the target species	Goal B; Target 3, 6
	All species at risk are in the recovery process	Species moves in a positive direction along the Red List continuum: Species Threat Abatement and Restoration (STAR) metric	Goal A; Target 4
	Connectivity is retained or restored	Some structural connectivity is in place in streams and among terrestrial habitat patches	Goal A; Target 12
	Ecosystem level		
	Retain all patches of native vegetation (land and estuaries)	All patches are inventoried and secured 20% of native vegetation is restored with particular attention to pollinator habitats	Goals A, B; Targets 10, 11
	Superabundant species and exotic species are managed	Exotic and superabundant species are controlled to reduce ecosystem harm and disease risk. New exotic species are controlled quickly	Goals A, B; Targets 6, 12
	Agricultural waste and chemicals (nutrients and pesticides) are kept out of freshwater, streams, and wetlands	No nutrients, herbicides, or pesticides are detectable in freshwater systems	Goal A; Target 7
	There is good urban planning to prevent sprawl and keep the best farmland in production	The best farmlands are retained; there is no increase in area under cultivation	No Goal; Target 10
	Provide people with access to nature for mental and physical health	Equitably distributed, convenient access to green and blue spaces is realized	Goal B; Target 12
	Natural processes		
	There is safe travel for migratory birds and marine life and secure migratory stopovers and nesting sites	All migratory stopover and nesting sites are inventoried and secured Safe travel for birds is increased by reducing collision risk (turning off unnecessary lights in buildings) and controlling domesticated cats Fishing nets are managed to avoid interfering with migratory marine species	Goals A, B; No target
	Hydrological processes are retained and improved; restoration of all four dimensions of freshwater connectivity is carried out as much as feasible	Development on floodplains is halted and reversed where feasible No new dams appear and/or dams are removed where appropriate Seasonal sediment transports return to natural patterns	Goals A, B; No target
	To secure carbon sequestration and storage, all mangroves, seagrasses, and wetlands are retained and restored, and patches of native vegetation are retained (see ecosystem-level actions)	Areas of mangroves, seagrasses, and wetlands increased with good hydrological connectivity	No goal; no target
C2 – Shared Landscapes	Species level		
	All species at risk are in the recovery process	Species at risk increased to a minimum population size of 500	Goal A; Target 4
	Missing keystone species are reintroduced	Missing keystone species are assessed and the reintroduction process has begun	Goal A; No target
	Harvest levels do not diminish current patterns of abundance or distribution	A species' status does not fall below its current Red List status or Green Status	Goal B; Target 4 Red List; No target; Green Status
	Ecosystem level		
		Species levels are assessed for Green Status function and secured; harvest levels are consistent with goals	Goals A, B; Target 9 (partial)

(Continued)

TABLE 1 Continued

Actions	Metrics	Goals and targets
All native species currently performing ecological functions remain at current levels of abundance or increased if needed		
Retain all native vegetation (land and estuaries)	No new areas are cultivated All primary ecosystems are retained	Goal A, B; Targets 1, 3, 8
Industrial resource extraction (mining, logging, oil, and gas) discharges no sediments out of season or pollutants into watercourses	Water quality, sediment load, and timing are adhered to	Goal A; Target 7 (partial)
Exotic species are eliminated or controlled Superabundant species are reduced	Exotic species are eliminated to reduce ecosystem harm Superabundant species caused by loss of predation are reduced in number to reduce ecosystem harm New exotic species are controlled quickly	Goals A, B; Targets 6, 12
Further cultivation is prevented	There is no increase in area under cultivation	Goal A; Target 10
Ecosystem connectivity and core habitats are secured through an ecologically representative and interconnected system of protected and conserved areas covering at least 30% Protected and conserved areas are managed effectively and governed equitably	Key biodiversity areas are identified Protected or conserved areas, as well as functional connectivity, are present for all species Indigenous and local communities are properly engaged At least 30% of land, freshwater, and ocean is effectively protected or conserved to achieve equivalent outcomes to protected areas, with effective management and equitable governance	Goal A, B; Targets 3, 8
Gaps in ecosystem connectivity are mitigated	Wildlife crossings are built to mitigate infrastructure (trains, roads, and dams), so functional connectivity is restored There is no isolation of minimum viable populations (500 individuals) from their meta population	Goal A, B; Targets 2, 3, 4
Domestic animal grazing levels are managed appropriately	There are appropriate stocking rates to maintain good range conditions Domestic animals are kept out of streams and wetlands	Goal A; Target 2
Natural processes level		
All migratory breeding and wintering sites, migration patterns within the ecosystem, and continental stopovers are secured	All migratory patterns, stopovers, breeding, and wintering sites are inventoried and secured	Goals A, B; No target
Large-scale hydrological processes are retained and improved There is retention and restoration of all four dimensions of freshwater connectivity	There are no new dams and there are dam removals Seasonal sediment transport is kept at or returned to natural patterns	Goal A, No target (except Target 2 restoration)
There is efficient carbon sequestration and storage All primary ecosystems are retained and secured	There is no old-growth logging There is no new cultivation	No goal; no target
There is sustainable resource extraction	Existing disturbance footprint is the primary focus of operations but where new impacts are unavoidable, the Mitigation Hierarchy framework should be followed and overall landscape context improved	Goal A; Target 10
Water flow is retained with enough energy and volume to drive ecosystem structure	A minimum of 80% natural water flow is retained or restored	Goal A; No target (except Target 2 restoration)
Sediment flows follow normal seasonal variability	There is no discharge of sediment from roads, railways, or industrial resource-extraction sites outside of natural seasonality	Goal A; No target

(Continued)

TABLE 1 Continued

	Actions	Metrics	Goals and targets
C3 – Large Wild Areas	Species level		
	All abundant species are retained and perform ecological functions	Harvesting rates are consistent with abundance All species are managed to Green Status 3 levels	Goal A; No target
	Species at risk are secured	All species at risk are identified with an action plan toward protection and conservation	Goal A; Target 4
	Ecosystem level		
	All species are able to move in existing natural patterns	There is no new fragmenting infrastructure (new dams, roads, and railways)	Goal A, B; Target 1 (accelerated)
	Ecosystems remain intact	There is no new resource extraction industry (logging, mining, oil, and gas)	Goal A, B; Target 1 (accelerated)
	Natural processes level		
	Biome function is secure	There is 80% tropical forest cover	Goals A, B; No target
		Migrations within biomes and across biomes are possible	
	Hydrological processes are maintained in a wild state	No dams or roads are impacting wetlands or peatlands directly or indirectly	Goals A, B; No target
		There are no water diversions All four dimensions of connectivity are intact There are natural patterns of sediment transport and flooding	

of the species and ecosystems that were intended to be conserved but also of hydrological and biome functions critical to humanity (Box 3).

These large-scale Earth system processes are essential to meeting the GBF's vision of a healthy planet and are implied in Goal B. They are also recognized in the “ecosystem approach” (164), which the GBF states should guide its implementation. However, large-scale natural processes are largely absent from the GBF's targets and indicators. They can be broken down into three categories:

- Abiotic hydrological processes: These are major drivers of ecosystem structure and carbon storage, influenced by biotic feedbacks.
- Intact biome functions: These drive global processes, such as rainfall, through the integrity of biotic and abiotic processes.
- Biotic migrations: These occur at the biome and global scales, are essential for maintaining ecological integrity, and have some abiotic effects.

BOX 3 Action at multiple biodiversity scales: example of the harpy eagle and Amazon Basin

All three interacting scales of biodiversity—natural processes, ecosystems, and species—need to be measured and addressed in a nature-positive manner. The harpy eagle (*Harpia harpyja*) in Amazonian forests illustrates this point.

The harpy eagle is a large apex carnivore of the tropical forest that preys on large arboreal mammals and nests on emergent trees. At the species level, we can assess its presence or absence and estimate whether its population is large enough for viability (minimum 500 breeding individuals). However, this alone is insufficient. As a top-down regulator, the eagle's presence and function are vital for maintaining forest health. It must be widely distributed across the forest to regulate herbivore populations and contribute to ecosystem stability (165). Therefore, both presence and ecological function must be measured, along with human-induced mortality rates (166).

Even if the eagle population appears viable based on individual counts, it cannot persist if its forest habitat or prey species are lost. For example, a 50% loss of forest habitat leads to reproductive failure (167). Moreover, the removal of tall canopy trees, essential for nesting, also reduces population viability, even if forest cover remains above 50% (168). But measuring ecosystem extent alone via remote sensing is insufficient; a species-level assessment is needed to determine whether harpy eagles and their prey are actually present.

Further, if we focus only on species and ecosystem assessments, we overlook key dimensions of natural processes. The Amazon rainforest spans multiple ecosystem types, and its hydrological processes are vital for forest survival. Two forest types, *várzea* and *igapó*, are floodplain forests covering 750,000 sq km and rely on seasonal flooding. Changes to hydrology caused by river channeling, damming, and water diversion threaten their structure, composition, and function (169). Heavily used by harpies, these ecosystems depend not only on local fluvial processes but also on hydrological connections upstream, as far as the Andes (Box 1).

Biome function is also critical to consider for harpy eagle survival. Moisture influx from the Atlantic Ocean initiates rainfall in the eastern Amazon, but forest evapotranspiration generates a significant portion of inland precipitation from there all the way to the Andean mountains (56). The forest recycled water is critical for maintaining upland forests, wet peatlands, as well as rivers and floodplains (170), which in turn support the rainforest ecosystem and frugivorous freshwater fish essential for forest regeneration. If more than 20% of the forest cover is lost, the rainforest could transition into a savannah-like state (57), resulting in the extinction of species like the harpy eagle and the collapse of many “tele-connected” ecosystems (171). This would not only devastate biodiversity but also disrupt agriculture, as the Amazon contributes to precipitation patterns across the Western Hemisphere, and would release vast amounts of carbon into the atmosphere (Box 2).

Hydrological processes

The GBF does not address hydrology. This is a major omission because freshwater regimes, unimpeded riverine connectivity, and unpolluted water are of such significance that maintaining or restoring hydrological processes, water quality, and associated floodplain and delta habitats is the most important NP action for a disproportionately wide variety of terrestrial, freshwater, and marine organisms (137, 172, 173).

Healthy running water ecosystems depend on the condition of their terrestrial watersheds (113) and vice versa. Big river systems, such as the Mississippi in the United States or the Brahmaputra, Tsangpo, Yarlung Zangbo, Jamuna, and Ganges system in South Asia, traverse substantially different biomes, making ecosystem-scale metrics inadequate for monitoring continental-scale structure or function. Rivers and streams embody the key elements of ecological connectivity, providing both unimpeded movement of species and flow of natural processes (174–176). Hydrologic connectivity at the ecosystem scale is particularly important to freshwater vertebrates, whose populations have declined by an average of 83% (177). Large-scale connectivity is also critical for a wide range of terrestrial and avian species that interact with river floodplains (178), and it directly influences water quality (179), sediment flows (180), and fish migrations (181).

Intact hydrological regimes are also essential to maintaining the vast carbon storage capacity of peatlands (42) and mangroves (46, 49) and retaining methane (37). However, river systems throughout the world have been significantly modified by dam construction (49, 182). Ostensibly built to supply low-carbon “green energy”, high-head hydroelectric dams are highly nature negative (Box 1).

Freshwater hydrological processes are not limited to water in rivers, lakes, and groundwater (blue water) but also include soil moisture (green water) (183). An essential part of the water cycle, soil moisture transforms into evapotranspiration (vapor flows) in all photosynthesizing terrestrial ecosystems. Green water stocks consist of the soil moisture that feeds all biomass growth. Green water flows are the total flux of vapor, including evaporation and transpiration, as well as interception. Accounting for 60–65% of annual global hydrological flows, they are key to ecosystem functioning and services, supporting food production, biomass on land, and carbon sequestration.

The function of intact forests in green water flows and the climate system is particularly important (121). Stomata (pores in leaves) regulate both water vapor and carbon dioxide (CO₂) exchange between a tree's intercellular space and the atmosphere (184, 185), affecting both precipitation and carbon sequestration. Forests everywhere have a local cooling effect that is lost whenever they are removed (186). Tropical forests and mid-latitude forests to about 40° North also cool the global climate through evapotranspiration. Climate change also causes variations in green water outside normal seasonal cycles, which in turn leads to major reductions in the land carbon sink. (187).

Water vapor from forests is important to rain generation (188, 189). Extensive forest loss can disrupt precipitation patterns across continents (65, 113), heightening the risk of large-scale food

insecurity and financial losses (64), especially in the tropics. Tropical forest losses are caused by forest clearing for commercial and subsistence agriculture, logging, charcoal production, and livestock grazing and by uncontrolled fire (190), dams, mining, overhunting (191), roads, and other linear clearings (67). Elimination of seed dispersers due to habitat loss and overhunting impairs forest regeneration (192) and causes declines in carbon storage (193). Deforestation (responsible for 75% of rainfall reduction) and global warming (25% of the reduction) have combined to reduce precipitation in the Amazon Basin by 16 mm per dry season while in areas with heavy deforestation (>28.5% cleared) the rainfall reduction is three times greater due to the added localized increase in temperature and drying (194).

At the global level, assessments of green water reveal dramatic, detrimental changes to the Earth's water cycle (113), resulting in critically important structural and functional losses of species, ecosystems, and natural processes.

Hydrological actions and metrics

There are four dimensions of hydrologic connectivity to be addressed and measured for NP (12, 195):

- i) Longitudinal connectivity: connectivity between upstream and downstream (river continuum concept) (196)
- ii) Lateral connectivity: connectivity between channel, floodplain, and riparian areas (flood pulse concept) (197)
- iii) Vertical connectivity: connectivity between groundwater and surface water (function of hyporheic zone) (198)
- iv) Temporal connectivity: hydrogeomorphic change through short and long time periods (shifting habitat mosaic concept) (199).

Actions to halt and reverse the loss of connectivity in the world's rivers align well with the 3Cs:

- C1 (heavily modified landscapes): All four dimensions are likely to be impacted, and restoration is NP.
- C2 (shared landscapes): Retaining existing and repairing impaired longitudinal, lateral, and seasonal connectivity is essential.
- C3 (intact landscapes): Keeping rivers wild and free-flowing is key (200).

An Earth system boundary metric suitable for NP has been developed for natural flows (201), with specific objectives for each of the 3Cs:

- C1: Retain and restore natural flows across landscapes and adjacent marine areas, reduce storm flash flows, and maximize green water retention to mitigate flood risk.
- C2: Aim for a minimum of 80% natural flow retention and restoration.
- C3: Preserve all natural flows in an unimpaired state.

Guidance on maintaining and measuring sediment flows is already available (202). Importantly, while continuing and restoring sediment transport is vital for healthy freshwater and estuarine systems (203, 204), human-induced sediment flux into freshwater systems can be harmful, especially outside normal cyclical seasonal flushes (205, 206).

A global green water planetary boundary metric indicates that no more than 10% of Earth's land area should deviate (in dry or wet direction) from its natural green water variability during the late Holocene (3, 113, 185). Today, 18% of Earth's terrestrial land area exceeds this boundary (3). We discuss this further under the sections *Biome function* and *Biome intactness actions and metrics*.

Biome function

A biome is a large-scale aggregation of related ecosystems (207) characterized by areas of vegetation of the same life form (208), and it is the largest biotic unit after the biosphere. Biome function, tied to intactness, affects continental- to global-scale processes. Despite the absence of biome-specific targets in the GBF, they are needed to achieve both the NP global goal and the GBF's vision.

Biome condition affects rainfall, with widespread effects on carbon storage, ecosystem health, and agricultural productivity, as discussed above and illustrated by Amazon and Congo Basin rainforests (Box 2). Maintaining and restoring forest cover at the biome scale is therefore a priority NP action. Forests are not the only areas where land-use changes affect precipitation. In Western Australia, the clearance of 13 million hectares of dry bush for agriculture using non-native species has directly reduced cloud cover and rainfall relative to areas with native vegetation (209).

The GBF lacks explicit targets or indicators for biome intactness, which should be an explicit conservation objective (210). Indirectly, T1 calls for land-use planning to stop the loss of areas of high biodiversity importance (including ecosystems of high ecological integrity) by 2030. However, action by 2030 is not sufficient. Some tropical forests are on the path toward a tipping point beyond which they may transition into savannah-like vegetation (Box 2). Given recent rates of tropical forest logging, 2030 is too late. Halting tropical forest cover loss and degradation everywhere must be an immediate top priority if these efforts are to protect these biomes, sustain their species and ecosystems, and ensure rainfall throughout the tropics and downwind agricultural regions.

Biome intactness actions and metrics

The best available metric for sustaining rainfall production in tropical forests is to maintain biome-scale forest cover, limiting losses to $\leq 20\%$ of original primary forest extent (57) and ideally restoring losses to achieve 90% cover to increase resilience to climate change (211). However, some researchers are unwilling to identify any threshold of acceptable forest cover loss (194). For restoration, fast-growing species (including non-natives) aid initial rainforest recovery; the long-term NP goal is to use native slow-growing hardwood species (136, 212). More research is needed to establish a metric for dryland vegetation change.

Migrations

Migration is a specific kind of animal movement where species move between different habitat regions at different times of the year, usually driven by season (213). It has become an urgent conservation problem because not only are migratory populations in decline, but 58% of sites monitored by the CMS are under unsustainable pressure, and 399 endangered migratory species are not even listed for CMS protection (10). In North America, 419 native migratory bird species have experienced a net loss of 2.5 billion individuals since 1970 (214). These losses occur extensively in C1 areas caused by free-ranging domestic cats (mostly unowned) preying on migratory birds (215) and by migratory birds striking illuminated buildings at night (216).

Migration affects species health and diversity (217), ecosystem function and structure (9), and carbon storage in ecosystems (134). Migratory movements range from short seasonal shifts between small habitat patches to transcontinental intergenerational migrations, as seen in monarch butterflies (217). Therefore, conservation strategies focused solely on resident species are insufficient to protect migratory populations (9). Migration is also different from animal movements within a home range to establish a new home range or to find mates in a metapopulation. These all require connectivity but are not migrations (213). Similarly, the need for species to move their range in response to climate change requires connectivity (218), but is not migration *per se* (219), although climate change could lead to migratory range shifts (220).

Migration is not mentioned in the GBF except by implication through ecological and landscape connectivity, which are to be addressed at the country level (GBF T2 and T3) (175). While protecting ecological connectivity across a species' migratory range is essential for migration (10), species movements often transcend national boundaries. The lack of attention to migration is a material deficiency in the GBF because it applies to the CMS as well as to many countries that are not signatories to the CMS.

Migration actions and metrics

For many migrating species, there are well-established approaches to protecting habitats essential for critical life-history events, including wintering and stopover resting habitats, as well as breeding areas (10, 221). These conservation actions require species-specific assessments for NP actions to ensure that habitat patches and their connectivity enable safe breeding, rearing, and travel across a species' full migratory range (222). For sea turtles, for example, a structured conservation framework has been developed to secure their movements across terrestrial, nearshore, and high-seas environments, which could be adapted for other migratory marine animals (223).

Major losses of migratory birds through cat depredation could be substantially reduced by controlling cats in C1 areas (224), and mortality due to building strikes could be greatly reduced by turning off unnecessary lights at night (225). Regarding terrestrial

connectivity, metrics to guide conservation efforts are available as outlined by Keeley et al. (226), while conserving hydrologic connectivity is of utmost importance due to its critical role in supporting both freshwater and terrestrial migratory species.

Ecosystem level

The CBD defines ecosystems as a dynamic complex of biotic (plant, animal, and microorganism) communities interacting with their abiotic environment (geophysical, climatic, and chemical processes) (227). Four elements define an ecosystem type: (1) characteristic native species, (2) abiotic environment, (3) key ecological processes and interactions, and (4) spatial distribution (228). While many mechanisms influencing species' vulnerability also apply at the ecosystem level, ecosystems embody natural processes that are not adequately captured through species-by-species conservation efforts (228). This underscores the importance of ecosystem-level actions in biodiversity conservation.

The ecosystem equivalent to species extinction is ecosystem collapse, which occurs when an ecosystem's inherent resilience is overwhelmed, resulting in a phase shift to a different and often novel ecosystem state (229, 230). An ecosystem collapses when one or more key defining variables are functionally impaired, including geomorphological features, species composition, nutrient cycling, disturbance regimes, ecological connectivity, and other biotic and abiotic processes. Vulnerability thresholds have been identified: ecosystems are considered at risk when 30% of their structure is degraded, functionally impaired at 50% degradation, and approaching collapse at 80% degradation (228).

Recently, there has been a discussion of the potential conservation value of novel ecosystems (231). New species assemblages, some of which may be exotic, could create new self-organizing ecosystems that have value for biodiversity conservation or ecosystem function. These emerging systems may warrant conservation attention, but a great deal of research remains to be done on them (232). The primary focus of NP conservation is retaining and restoring the composition and function of native ecosystems.

Some vertebrate species perform processes disproportionately vital to ecosystem function. These species act as ecosystem engineers or keystone species, regulating trophic cascades (e.g., wolves and sea otters), shaping vegetation structure (e.g., elephants and bison), or influencing hydrology and wetland formation (e.g., beavers) (166). Foundational species in nearshore marine environments (e.g., kelp and corals) play critical roles in preserving ecosystem structure (23). Fortunately, small and abundant species that are also vital to ecosystem function benefit from conservation actions that are aimed at suites of larger species through an "umbrella" effect (233), but attention should be paid to their demographic robustness as well (234). Conversely, invasive species can degrade ecosystems by displacing native species and disrupting natural processes.

Ecosystem actions and metrics

NP ecosystem goals will vary according to the 3Cs. C1 areas contain ecosystems that have already collapsed and can be described as crisis ecoregions (235). These landscapes support most of the human population and produce most of the world's food calories, so other important values are at play (143). While ecosystem restoration to full function is impractical under C1 conditions, all remaining fragments of primary ecosystems should be secured, and at least 20% native vegetation cover should be restored to support ecosystem services (236). This includes urban re-greening for multiple ecological and human benefits (237, 238), which is well covered in GBF T12. Agricultural chemicals are most common in C1 areas, which require practices that keep excess runoff out of waterbodies. Safeguarding areas of high agricultural productivity through prevention of urban sprawl serves as an indirect NP practice, preventing further degradation of C2 lands for marginal agriculture and contributing to the SDGs. Combined with improved agricultural practices, dietary adjustments, reduction of food waste, and better global fisheries management, the current cultivated land could feed a global population of up to 10 billion people (239, 240). Such a food systems shift can be done in a just, equitable, and NP manner that halts the loss of intact areas and includes restoration of marginally producing areas to forest cover (241).

NP actions in ecosystems that are less than 50% impaired (C2 areas) should prioritize retaining or restoring overall ecosystem integrity to well above 50%. This requires halting habitat degradation and fragmentation, preserving all remaining intact areas, and retaining and restoring natural abiotic processes, such as fire regimes and hydrology (242). GBF Target 3, which mandates interconnected conservation of at least 30% of land, sea, and freshwater, is particularly well-suited to C2 areas, and such networks will also support climate adaptation efforts (218). Large intact ecosystems (C3 areas) are often aggregated in biomes and should be maintained intact, which requires accelerated action under GBF Target 1.

Across the 3Cs, actions to protect and restore keystone, top-down regulating, and foundational species contribute to NP at the ecosystem level (166, 243). These species also provide positive feedback to the climate system by preventing carbon release and enhancing carbon sequestration (96, 134). Large carnivore and large grazer restoration efforts are best suited to C2 and C3 landscapes. Removals of invasive species can have positive effects across ecosystems (150) and improve green and blue water availability (244). Removing exotic species constitutes an NP action unless they have become part of a novel ecosystem that supports endangered species (245, 246); such exceptions will typically be restricted to C1 areas. Ecosystems also benefit from reducing populations of native generalist species that have become overabundant owing to their adaptability to human-dominated landscapes, the absence of predators, or confined ranges (247), which also aids in zoonotic disease prevention (28).

Species level

Native species are integral to the Earth system, and healthy populations with reliable access to food supplies are less likely to shed pathogens that cause disease in humans (33). The NP goal for species is to increase their distribution, abundance, functionality, and resilience, maintaining genetic diversity and preventing extinctions (91). In contrast, the GBF target for species only focuses on the latter two (T4) (248).

Worldwide, species are in decline due to habitat loss (the primary driver of species loss on land) and overharvesting (the primary driver of loss in the ocean). Other important drivers include industrial production processes, such as deforestation, mining, chemical pollution, cereal crops, and palm oil plantations, the expansion of marginal agriculture, deliberate and inadvertent introduction of invasive species (249), as well as global warming, which alters thermal conditions for species and habitat niches in ecosystems (250).

Species status varies significantly across the 3Cs. At-risk species exist in all three (251), but most are found in C1 areas (143). Moreover, species loss for C1 exceeds detectable presence as many large-bodied species have already been lost from these heavily transformed landscapes (86, 252, 253). In contrast, some largely intact C2 landscapes show remarkably complete faunal assemblages with robust genetic diversity still performing natural processes, such as migration (e.g., Serengeti-Mara). However, while C2 areas often have complete or near-to-complete faunal assemblages, they also suffer from species at risk, extirpations of some populations, declines within populations, and reduced genetic diversity (e.g., large mammals tend to decline first) (86). In addition, their aquatic integrity is often compromised by river damming. C3 areas, being the least disturbed, have few at-risk species, with the primary threat being overexploitation or climate change impacts. However, their sheer size, intactness, and inherent connectivity make them the most resilient of the 3Cs to climate change and least vulnerable to overexploitation (254).

Species actions and metrics

The NP goal to increase the distribution, abundance, function, diversity, and resilience of native species requires halting loss by maintaining intact species assemblages, increasing populations toward ecological functionality, and reducing extinction risk across the 3Cs (Figure 4).

This includes addressing overexploitation of species through enforced regulations or long-standing customary practices, preventing hyper-abundance of species that degrade ecosystems, implementing anti-poaching programs, and promoting active human-wildlife coexistence efforts everywhere.

Maintaining intact species assemblages

Healthy ecosystems that retain the full array of native species interacting with intact natural processes are of the greatest value to the Earth system. They also serve as a barrier against the spillover of potential pandemic-causing pathogens into human populations (131). Despite advances in ecological restoration and species

recovery, there is no substitute for preserving original, intact systems. The NP goal of halting nature loss prioritizes the protection of all remaining intact ecosystems and species assemblages wherever they occur—whether in C3 areas, intact parts of C2 landscapes, or in remnant patches within C1 regions. While GBF T4 is silent on maintaining intact species assemblages and abundance, Targets 1 and 3 (spatial conservation) and Target 9 (preventing overexploitation) are aligned with this NP objective.

Restoring functional species populations

Achieving the NP goal of reversing nature loss by 2030 and fully recovering nature by 2050 requires thriving populations. Moreover, NP requires a focus on ecological processes, not just patterns of persistence. The common threshold of an effective population size of at least 500 (Indicator 4 for GBF T4) indicates reduced extinction risk but tells us nothing about whether the species is abundant enough to perform ecological processes at a scale that contributes to Earth system stability (9, 255). Similarly, counting species diversity as a metric of success is insufficient. High diversity of small-bodied species does not compensate for the loss of large vertebrates that perform keystone and regulatory functions such as predation, herbivory, and seed dispersal (243, 255).

The International Union for Conservation of Nature (IUCN) Green Status Framework (163) provides guidance for three NP metrics designed to ensure that species populations are large enough to sustain ecological function across landscapes and maintain resilience:

- Green Status 1 (GS1): The species exists in multiple interconnected populations, each with at least 500 individuals.
- Green Status 2 (GS2): The species is fulfilling its ecological role, with missing species reintroduced where feasible.
- Green Status 3 (GS3): The species exists in a representative set of ecosystems and communities throughout its historical range.

Progressively moving species along this Green Status continuum, from GS1 toward GS3, and maintaining them in a higher status is a contribution to NP (Figure 4). Some C2 systems are close to hosting intact large vertebrate assemblages, often missing only one to three species in the less impacted C2 regions. In such cases, reintroduction is relatively simple and could help move these ecosystems toward GS3 (256). Where species already exist in GS3 status (in many C3 areas), maintaining this state is essential to achieving the NP goal of halting biodiversity loss.

Reducing extinction risk (threatened species)

Preventing extinction is an urgent conservation priority, as the natural background species extinction rate has been greatly exceeded in the Anthropocene (257). Recovery of an extinct species is not yet possible and may never be. Conservation goals should therefore focus on reducing the extinction rate attributable to human activity, which exceeds the natural background rate (258). GBF T4 calls for halting human-induced extinctions of known threatened species and for their recovery and conservation, significantly reducing extinction risk. A key indicator for T4 is the widely used minimum viable population threshold of 500 individuals.

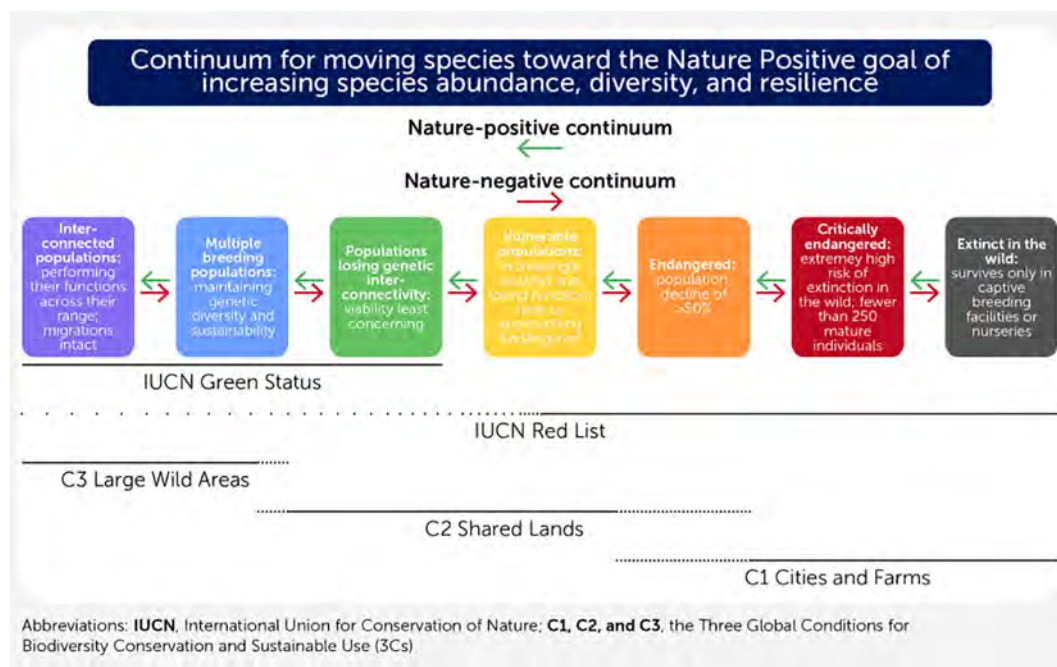


FIGURE 4

Continuum for moving species toward the “Nature Positive” (NP) goal of increasing distribution, abundance, function, diversity, and resilience of species and avoiding extinction. The present trend is either nature negative (i.e., moving species toward the right side of the continuum) or neutral (i.e., static on the continuum). Species on the far left-hand side are already contributing to NP, and their distribution, abundance, and function should be retained to halt biodiversity loss. Actions to reverse species loss and increase their distribution, abundance, function, diversity, and resilience will progressively move species toward the left. At the bottom, the likely location in the Three Global Conditions Framework (3Cs) of species relative to their status along this continuum is indicated. Controlling species exploitation levels is essential across all 3Cs.

The IUCN Red List remains the most comprehensive assessment tool for identifying and categorizing threatened species along a continuum from least concern to global extinction (161). NP-aligned actions for threatened species aim to progressively improve their status along this continuum. Moving each species up one category or more, in a ratchet-like manner, contributes to NP (Figure 4). A “Reverse the Red” campaign actively promotes this approach, emphasizing targeted conservation actions to improve a species’ status (259).

A tool for measuring the progress of species toward nature positivity along the extinction risk continuum is the IUCN’s Species Threat Abatement and Restoration (STAR) metric (162). Unlike the IUCN Green Status, which focuses on the functional distribution across a species’ range, STAR emphasizes reducing extinction risk at specific sites and highlights opportunities for interventions to reduce extinction risk where they are greatest. The STAR system is particularly useful in C1 areas and in the more fragmented parts of C2. For an actor seeking to contribute to NP at the species level, STAR provides a multi-step assessment process that leads to an appropriate threat reduction strategy. The IUCN has published guidance on using the STAR metric to contribute to NP outcomes (260).

Protecting areas to avoid imminent extinction of rare, narrow-range, endemic, and threatened species is an important action under GBF T3, particularly in C1 areas. The Conservation Imperatives approach provides a guide for identifying such priority sites across all 3Cs (160).

Genetic diversity

Genetic diversity is essential for maintaining healthy populations of any size. It is inherently supported by many of the above actions. However, care must be taken to ensure that large populations of recovered species are genetically robust enough to retain resilience, which may require reintroducing genetic diversity (261).

Enabling social and economic conditions for a Nature Positive shift

We now move from conservation actions and metrics to enabling social and economic conditions necessary to achieve the NP global goal. We begin with diverse cultural perspectives, governance, and equity between the Global North and Global South.

Engaging diverse cultural perspectives in Nature Positive

Arising from contemporary empirical science, the NP approach incorporates a holistic understanding of life and a responsibility to act for the health of the planet. It positions human development as being embedded in nature rather than as a competing interest with it (Figure 1) and emphasizes the importance of considering the flow of natural processes over time at varying scales. But not all cultures are driven by empirical science.

Humans interacted with nature throughout the Holocene (262). Many ethnocultural traditions from South Asia, China, Africa, and Indigenous peoples worldwide converge in viewing humans as embedded ecological participants with relational responsibilities to live in balance and harmony with a dynamic natural world, rather than as having rights to exploit static natural resources (263–265). The NP approach is aligned with those cultural perspectives that provide a basis for a shared vision for humanity to live well while respecting nature's biological patterns and natural processes, as discussed further in *Nature Positive Society*, a companion paper to this article (266). Engagement on an equal footing with other cultures' relational and intrinsic values (267) will increase support for NP goals.

Other knowledge systems could also give rise to NP conservation approaches and metrics complementary to those we have outlined. For example, Indigenous and local communities often possess deep knowledge of the sustainability of their ecological contexts based on long-term observation and interactions. This can be embraced alongside empirical science through mutual respectful engagement in “ethical space”, where the goal is reconciliation of knowledge systems to achieve NP (268).

Nature Positive governance reform

Meeting biodiversity, climate, and social goals contemporaneously will require greater integration of governance to carefully identify co-benefits, trade-offs, and co-detriments (149, 269) and is urgently necessary to avoid tipping points (270). Yet we lack strong global governance for sustainability. The CBD and UNFCCC/Paris Agreement are structured to place primary responsibility for implementation on state parties, although an International Court of Justice (271) advisory opinion has created the possibility for Global South countries that suffer adverse effects of climate change to sue for damages where a Global North country's failure to meet its commitments has led to direct harm.

In many countries, nature is usually the purview of an environment department rather than fully integrated into high-level decision-making processes, which is necessary if we are to meet global goals (92). Through systemic national-level integration, Costa Rica successfully halted and reversed biodiversity loss from 1990 levels (272). It is common in federal systems for provinces to control land use and, in some countries, for municipalities to govern large areas. Integration of national and sub-national governance, policies, and actions is essential and will be the focus of a global Nature Positive Summit in Japan (273).

Indigenous peoples' territories often have significant biodiversity, but frequently they have been marginalized from governance of those areas, contrary to the UN Declaration of the Rights of Indigenous Peoples (274). Power imbalances and lack of capacity can be addressed effectively and equitably (269) in a bio-cultural approach (275) that moves beyond consultation or financial compensation into design, governance, and financial participation (276). NP governance innovations that embed nature in all aspects of decision-making have emerged from Indigenous peoples themselves—e.g., the Buffalo Treaty among

First Nations and Tribes of North America (277) and Māori people initiating personhood for rivers in New Zealand/Aotearoa (278).

Nature Positive shift and finance

Funding is required to implement conservation measures. Informed by the Paulson Report (279), GBF T19's funding target to implement national biodiversity strategies and action plans is at least US\$200 billion from all sources. This includes overseas development assistance (ODA) from rich nations of at least US \$20 billion annually by 2025 and US\$30 billion annually by 2030, which we discuss next in the context of equitable sharing of responsibilities between the Global North and Global South.

Equitable sharing of responsibilities between the Global North and South

In the developed North, advanced economies must conserve remaining intact nature, restore degraded natural systems, and decarbonize at their own expense. This transition requires strong political will, which could be driven by self-interest: continued environmental degradation will destabilize economies (80), threaten capital stocks (83), and intensify political instability through increased climate-related displacement and refugee crises (280).

In the Global South, similar actions are required. While degradation of nature occurs in both wealthy and poorer nations, the consumptive footprints of the Global North and newly industrialized nations are major drivers of biodiversity loss in developing regions. Similarly, climate change—primarily caused by emissions from wealthy industrialized countries and, more recently, by rapidly developing economies (281)—disproportionately affects poorer nations (282). Financial transfers from developed to developing nations are therefore equitable (283–286).

Both the CBD and UNFCCC have agreed on financial commitments. GBF Target 19 calls for overseas development assistance from rich nations of at least US\$20 billion annually by 2025 and US\$30 billion annually by 2030. A multilateral mechanism for the fair and equitable sharing of benefits from the use of digital sequence information on genetic resources, including a global fund, has also been agreed (99). The UNFCCC has an agreed US\$300 billion annual resource mobilization goal from North to South by 2035. It also operationalized a Loss and Damage Fund, with US\$730 million in initial pledges (287). Fulfilling these commitments is critical for achieving shared environmental goals equitably.

Many Global South countries struggle with national debt burdens, which restrict the financial resources available to them for both human development and NP implementation. Debt for nature swaps (DNS) started as an international public finance incentive to protect nature, involving debt forgiveness in exchange for conservation commitments (288). More recently, DNS have involved a reduction in the cost of borrowing for a

developing country in return for NP actions (289, 290). Concessional finance from multilateral development banks (MDBs) or guarantees from rich countries improve the investment grade of developing countries' debt, which reduces interest rates. Such debt cost reduction projects have been implemented in several countries with NP conservation outcomes (291, 292).

Nature Positive transformation of the dominant economic system

The NP shift also requires a transformation of the dominant economic system, which is recognized in the GBF. We discuss how this can be enabled by valuing nature in public accounting standards, and through ODA, MDBs, innovations in financial markets, and changes in business operations. We begin with valuing nature.

Valuing nature

T14 calls for changes in national accounting and fully integrating the values of biodiversity. Many people attach non-economic value to nature (293, 294), but the world's dominant economic system does not. There are critiques of attaching financial value to nature because it undervalues or ignores values reflective of human–nature relationships (267) and could result in privatization of public goods (295) or economic imperialism (296). However, achieving the NP shift will require alignment of the dominant financial system, which is currently driving the loss of biodiversity (80, 297). We focus first on public sector mechanisms to attach economic value to nature in national accounts.

Public sector finance and Nature Positive

The global financial system treats “natural assets” as free for the taking with the only cost being the expense of extraction or harvesting (80). The result is private enterprise capturing the value at the expense of the common biosphere (298). Private enrichment with externalized costs is counted as a positive number in standard national accounts and Gross Domestic Product (GDP) (299). Thus, nature-negative actions are counted as positive economic outputs in government finances. For the world to become NP, governments must address this systemic problem through standards, regulations, and the creation of market mechanisms (80).

The externalized cost of economic activity can be viewed as depreciating the “natural capital” that underpins the economy and human well-being, but without accounting for that loss of value to society (80) (Figure 1). Valuing natural capital and ecosystem services is an effective way to correct this by measuring and counting the value to society alongside the extracted value realized by an individual or corporation (80, 300). Natural capital (also known as tangible natural assets or stocks of nature) produces flows of ecosystem services that can be measured through a “shadow” price. In 2012, the UN System of Environmental-

Economic Accounting (SEEA) created a statistical Central Framework (CF) that enables countries to measure their natural capital and understand the contributions of nature to national prosperity and the importance of protecting it. Building on the CF, the UN also developed SEEA Ecosystem Accounting (SEEA EA), which provides a more in-depth view of the health of natural capital in each jurisdiction (301, 302). So far, over 90 countries compile accounts using SEEA CF, while over 50 countries also use the more detailed SEEA EA. However, these statistical frameworks are satellite standards to the System of National Accounts (SNA) and therefore have limited influence on how GDP is calculated by countries. To make an NP change, governments must meaningfully integrate SEEA EA into their system of national accounts and use this information to inform public sector decision-making.

Another avenue for integrating the value of natural capital into mainstream financial markets is to address barriers that limit the value of nature from being accounted for in public sector accounting standards. Currently, intact nature is left out of international accounting frameworks, and its economic value is not counted until it is exploited, purchased, or sold. Even formal area-based conservation actions by the state are viewed as an expense rather than an investment, and the resulting conservation areas are not viewed as assets in public accounting. However, in January 2026, the International Public Sector Accounting Standards Board (IPSASB) released IPSAS 51, Tangible Natural Resources Held for Conservation, which will allow governments to count conservation areas as tangible natural assets (303, 304). Getting countries to adopt this new accounting standard will be an important NP action (305).

Private sector investment in conservation

T19 seeks to increase private investment as part of the US\$200 billion for conservation measures, but it provides no pathways for it. In market terms, nature is worth more dead than alive. New markets for the “social value” of nature are needed (80), whether through regulatory support or capital market evolution.

Nature markets began with “no net loss” biodiversity harm mitigation laws, such as the United States Clean Water Act (306) and the United Kingdom's biodiversity net gain requirement under the Environment Act 2021 (307). Since these markets are inherently about mitigating loss, they can lead to further degradation of an intact area “offset” through restoration of a degraded area. This can help the world move toward less loss on the road to nature positivity (91, 308), but more than an offsets market is required to engage private investment to halt and reverse nature loss.

The European Union is evaluating a voluntary nature credits system (309). It builds on earlier private and government efforts to create biodiversity credits to sell to the private sector (310). Biodiversity credits require additionality, which means some improvement in the conditions of the underlying nature asset. Additionality is good for reversing loss through restoration (310). The International Advisory Panel on Biodiversity Credits (IAPBC) also includes improved governance and protection as an additionality. This may include Indigenous stewardship agreements

or legal designations that did not previously exist (310). Biodiversity credits are of interest to buyers motivated by charitable or social license considerations but not to investors who seek a financial return on investment.

Unlocking large amounts of private capital for intact nature will require financial innovations (311) that provide a return on investment or reduce risk to capital. Governments can stimulate the creation of market mechanisms through concessional finance. This approach underpins the innovative Tropical Forest Forever Facility (TFFF), intended to attract private investment to halt the loss of tropical forests. Led by Brazil, TFFF was launched at UNFCCC COP30 in Belem. Its goal is to raise an initial US\$25 billion from MDBs, ODA, and philanthropies to invest and also improve the investment grade of US\$100 billion of debt to be sold to private investors. The resulting US\$125 billion fund would then be invested to generate returns above the cost of borrowing, which is expected to net US\$4 billion a year. This would be paid to governments of tropical forest countries to halt deforestation, with a specific percentage of the funds earmarked for Indigenous and local communities (312). In the month it was launched, there were over US\$6 billion in pledges toward the initial US\$25 billion (313).

Heightened awareness of nature risk and interest in investing to reduce it (314) could create a market for halting the loss of nature. Large investors are “universal owners” of climate and nature risks because they are widely invested in the global economy (315). Thus, ensuring the stability of the Earth system represented by natural capital is in their business interest, and they could invest in it. There is an existing natural capital protocol for business (316, 317) that is consistent with SEEA (318, 319). Initiatives to “put nature on the balance sheet” have identified the limitations in accounting standards and frameworks that prevent the inclusion of non-purchased natural assets in financial statements and provided a road map for addressing the problem (319).

The International Organization for Standardization (ISO) released the world’s first international biodiversity standard in October 2025. ISO 17298 “Biodiversity — Considering biodiversity in the strategy and operations of organizations — Requirements and guidelines” provides companies, investors, and public institutions with a globally agreed rulebook for how to measure, manage, and report their relationship with natural capital (320). For the private sector, this defines how biodiversity risk enters credit rating, audit trails, and shareholder expectations.

Meanwhile, natural asset companies create an asset class for nature, enabling direct investment in protected natural capital (321). Similarly, insurance arrangements focused on avoiding loss of natural capital, in which part of the premiums received are invested in nature to reduce the likelihood of loss of ecosystem services vital to a particular economic sector, could be created. To stimulate the market and create a level investment environment, governments could regulate financial institutions and businesses to hold some percentage of their assets as natural capital (this could also create a market for biodiversity credits).

Local and Indigenous communities should be involved in the design, returns, and governance of nature and climate investments that affect their areas to ensure both equitable outcomes and

security of title. Including traditional knowledge systems will also likely enhance the performance of the underlying nature asset (269).

Private sector operations and subsidies

The NP shift requires economic transformation beyond government finances and private markets. Economic factors and consumption patterns are major drivers of both biodiversity loss and climate change and must be fundamentally transformed if we are to achieve the NP global goal (322). Here, we focus on realigning business operations.

Business interests have been involved in NP efforts since its inception, including in co-authoring the foundational NP paper (91) and successfully supporting the inclusion of targets in the GBF that encourage businesses to make an NP shift (317). The aims are as follows:

- All sectors should align their activities with the GBF (T14).
- Corporations should reduce their impact on nature and report their dependencies on nature (T15).
- Governments should eliminate US\$500 billion in nature-negative subsidies to business by 2030 (T18).
- Corporate and financial sectors should participate in GBF financing (T19, discussed above).

T14 and 15 have attracted significant interest from both operating companies and the financial sector (323), and there was substantial private sector participation at the Global Nature Positive Summit hosted by Australia and the state of New South Wales (324). In 2025, the World Economic Forum reported growing consensus around business alignment with the NP goal (325).

To transform operations, businesses will need to embed NP approaches across all business decisions (317). Alignment methods include both internal decision-making tools (such as the Natural Capital Protocol) and disclosure-related tools. The Task Force on Nature-related Financial Disclosures has developed voluntary guidance (adopted by hundreds of companies and financial institutions) to help businesses integrate nature into decision-making and shift financial flows away from nature-negative outcomes and toward nature-positive outcomes. (326). The Nature Positive Initiative is developing voluntary corporate NP metrics for businesses to make meaningful and reportable contributions to the global NP goal (327). Science Based Targets for Nature is developing a drivers-oriented framework to help companies align their activities with NP (328).

Measures like these will be mandatory in the European Union, which has passed rules scheduled to come into force in 2027 that will require companies to report on “sustainability matters” (environmental, social and human rights, and governance factors), including their supply chains and actions to prevent or mitigate adverse impacts (329).

Many of the world’s largest mining companies have collectively endorsed NP, asserting that “nature positive must be both an objective to be achieved, as well as an embedded approach to doing business” (330). Industry-specific NP approaches have now been proposed for the mining sector (331), the agricultural sector

(239), and wind farming (332). The Nature Positive Universities Initiative involves 500 private and public higher education institutions across the world committed to promoting nature on their campuses, in their supply chains, and within their cities and communities (333). There is also a well-developed mitigation hierarchy available for businesses to reduce inevitable impacts as part of the transition to NP (334). Rigorous attention to achieving assured NP outcomes will be required to avoid “greenwashing” (335, 336).

T18 materially understates the flow of public subsidies to private activities that must be changed: there is an annual net US\$7 trillion in nature-negative financial flows, US\$5 trillion of which are private (337). This requires public policy shifts in incentives (279), which will be more likely to happen with business support.

An NP world will only be achieved if there is a transformed, enabling economic environment. This requires alignment of financial incentives, business operations, innovation to make intact nature investable, public and private investments in conservation, and integration of government actions across the treaties.

Integration through co-reporting progress toward Nature Positive, climate goals, and the Sustainable Development Goals

We have demonstrated that achieving the SDGs and global climate goals is intrinsically linked to the NP goal. An explicit overarching objective for all three should be the integrated pursuit of an equitable, nature-positive, and carbon-neutral world (91).

Now that there is recognition of the nature–climate nexus from the parties to the CBD and UNFCCC and also the International High Court, national governments should align their reporting of Nationally Determined Contributions (NDCs) under the Paris Agreement and National Biodiversity Strategic Action Plans (NBSAPs) under the GBF. At CBD COP16, an initial step toward this integration was made by “urging ... parties to consider integrating into their NBSAPS ... approaches ... to climate change adaptation and mitigation” (99).

NBSAPS could immediately include carbon sequestration and storage indicators under GBF Targets 1–3 and 11. Similarly, the SDGs should explicitly acknowledge the GBF in SDG 14 and 15, as they currently recognize the Paris Agreement in SDG 13. Integrating NBSAPs and NDCs could be facilitated through the existing architecture under provision 4.19 of the Paris Agreement, which calls for long-term low-emission development strategies (338). Joint reporting across the Paris Agreement and CBD/GBF could also serve to track progress on SDGs 13, 14, and 15, while incorporating shifts in production and consumption patterns and the transformation of subsidies, aligning with SDG 12.

Both the GBF and Paris Agreement emphasize equitable outcomes, which are also a focus of SDGs 1–7, 16, and 17. Joint reporting on equity across these global agreements would mark a major advance as it would foster integrated thinking, improve

efficient deployment of financial resources, address underlying drivers in a coordinated manner, and achieve positive outcomes for both people and the Earth system. All of this joint reporting across the GBF, UNFCCC/Paris Agreement, and the SDGs should start immediately. As a further step, the integration of planetary boundaries and equitable objectives has been proposed through the concept of safe and just Earth system boundaries (104), for which Rockström et al. (201) provided Earth system boundary metrics. They should be widened to include the species, ecosystems, and natural processes discussed above. These global metrics could then be used by governments to assess progress toward living within all nine planetary boundaries.

Conclusion

The Earth system is rapidly unraveling. Protecting intact nature and restoring damaged ecosystems must be prioritized in global policy to the same extent as climate action under the Paris Agreement and the SDGs for human development. Realizing the GBF’s NP mission, goals, and targets, with heightened attention to natural processes and feedbacks, would be an essential stabilizing action. However, actions under the GBF alone are insufficient. We are at or near the critical threshold of 1.5°C of climate warming (339–341), beyond which the Earth system could cross tipping points (59).

Concerted, aligned, and monitored efforts across the CBD, UNFCCC, SDGs, and all of society are needed to create an NP future that is equitable and carbon neutral. To achieve this requires conservation action and an enabling social and economic environment that includes money to pay for it, reorientation of financial flows, a shift in production and consumption practices away from nature-negative activities toward positive outcomes, new financial mechanisms, and stronger coordinated governance that is equitable and people positive.

It is a grim irony that just as the need for integrated action at all scales has become both apparent and urgent, the UN system and multilateralism in general are under enormous pressure (309). Time has shown, however, that what is urgent eventually becomes apparent to even the most reluctant. There remain many actors who are both deeply concerned about the state of the world and highly committed to improving it, including a broadly based Nature Positive Initiative (342).

Achieving the NP goal of halting and reversing nature loss, with a net improvement by 2030 from a 2020 baseline, is essential for the well-being of humanity and the rest of life. It is the only pathway to ensuring that the 21st century progresses toward peace, prosperity, stability, better health, and natural beauty, rather than descending into a future marked by large-scale human displacement, violent conflict, fires, floods, disease, food and freshwater shortages, inhospitable climates, and ecosystem collapse.

It is time for us to recognize that nature is the foundation of all human affairs. Unless we act swiftly to make the world NP by 2030, our lives are likely to become very difficult in a destabilized Anthropocene.

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Author contributions

HL: Writing – original draft, Conceptualization, Writing – review & editing, Visualization.

JR: Writing – original draft, Conceptualization, Writing – review & editing.

RP: Writing – original draft, Writing – review & editing.

DL: Writing – original draft, Writing – review & editing.

LL: Writing – original draft, Writing – review & editing.

CP: Writing – original draft, Writing – review & editing.

FW: Writing – original draft, Writing – review & editing.

KK: Writing – review & editing, Writing – original draft.

LZ: Writing – review & editing, Writing – original draft, Visualization.

RS: Writing – review & editing.

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The original contributions presented in the study are included in the article/supplementary material. Further inquiries can be directed to the corresponding author.

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Perspective

Governing for “no net loss” of biodiversity over the long term: challenges and pathways forward

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SUMMARY

Economic development is increasingly impacting biodiversity, leading to a rise in biodiversity offset policies globally that aim to compensate for biodiversity losses. Many developments generating offsets create long-term, irreversible losses of biodiversity and, therefore, require biodiversity gains from offsets to be retained over the long term to have any hope of achieving “no net loss” (NNL) of biodiversity. This raises important ecological and institutional challenges that current offset mechanisms, built for politico-economic systems with short-term policy horizons, do not sufficiently consider. We explore this issue and discuss several responses to the problem ranging from incremental changes for improving on-ground management, through to major governance shifts required to support the long-term social-ecological resilience of offset sites. We argue that without these changes, at best, NNL policies participate in temporarily reducing permanent biodiversity loss. At worst, they participate in a false promise, distracting institutions from the transformative changes needed to reverse biodiversity depletion.

INTRODUCTION

With the increasing environmental impacts of economic development, biodiversity offset policies are spreading globally, aiming to compensate for the biodiversity losses induced by these activities, notably in the infrastructure, urban development, and extractive sectors.¹ Biodiversity offsetting (henceforth referred to as “offsetting”) is defined here as a set of institutional rules and practices that enable the production and retention of “biodiversity gains” across time and space to compensate for the loss of biodiversity from authorized damage, with the aim of reaching “no net loss” (NNL) of biodiversity (Box 1, and references therein). Although regulations, policies, and voluntary practices can define offsetting in different ways,^{2,3} here we focus on regulatory offsets and follow the terminology commonly used in the academic literature and best practice offset guidelines (Box 1). Offsetting usually corresponds to the last step of the mitigation hierarchy (Box 1) where the first step is to avoid impacts, followed by minimizing and remediating impacts. Finally, offsetting mitigates the remaining residual impacts on biodiversity.

Both biodiversity offset schemes and the NNL objective are already operationalized in multiple jurisdictions around the world.^{1,22} This uptake of offsetting schemes has been driven by the search for reformist solutions to conflicts over limits to development occurring across scales, including infrastructure and extractive activities.³ Offsetting theoretically enables the operationalization of the “polluter-pays” principle (Box 1). This conceptualization takes the current politico-economic system as a given, often proposing solutions based on technocratic approaches that empower the state, markets, and experts.³

Despite this global uptake, offsetting and NNL have remained controversial within the field of conservation.³ For example, the

ecological feasibility of recruiting biodiversity gains through ecological restoration and/or by averted losses (Box 1) has been questioned, due to the limits, uncertainties, and inherent time lags associated with both restoration and the accrual of averted losses.^{7,11,23,24} In addition, the current institutional capacity to deliver and maintain gains has been questioned due to limited evidence on offset effectiveness.^{4,25}

Best practice guidelines for biodiversity offsetting specify that offset gains need to be maintained until the authorized impacts on biodiversity cease, and preferably in perpetuity.^{12,15} Thus, the retention of biodiversity gains over the long term is a critical aspect of offsetting as developments generating offsets often create long-term and irreversible loss of biodiversity. The capacity to retain gains over the long term is therefore a fundamental requirement for offset schemes to deliver on the promise of NNL. Yet, this temporal commitment inevitably stumbles due to the fact that Western institutions are structurally blind to long-term concerns,^{26,27} being constructed to consider time frames of no more than few decades, and often much shorter periods based on policy cycles.

In this perspective, we investigate key challenges associated with ensuring the recruitment and retention of offset biodiversity gains over long periods of time. Using an interdisciplinary lens that draws from both natural and critical social sciences, we examine these challenges by (1) presenting key relevant concepts underpinning biodiversity offsetting, (2) clarifying the time frames involved in recruiting and retaining offset gains, (3) presenting some of the key approaches currently promoted and/or implemented to recruit and retain biodiversity gains “over the long term,” and (4) critically reviewing these approaches and proposing pathways to move forward.

Box 1. Glossary of key concepts used in the offset and social sciences literatures

Additionality: all recruited gains should not have occurred in the absence of the offset project and are fully additional to the expected scenario without the offset.⁴

Anthropocene: a proposed new geological epoch induced by the impacts of human activities on the Earth system since the industrial revolution of the late eighteenth century and accelerating since the 1950s; characterized by changes in major features of the system's structure and functioning, including the climate system, the water and nitrogen cycles, and biosphere degradation.^{5,6} These changes are and will cause major shocks to the social-ecological systems that have thrived in the previous epoch, the Holocene.

Averted-loss or avoided-loss offsets: offsets aiming to prevent future biodiversity loss via actions, such as the protection of existing biodiversity that mitigate threatening processes that would otherwise cause the depletion or loss of biodiversity.⁷

Biocultural diversity: "the diversity of life in all of its manifestations—biological, cultural, and linguistic—that are interrelated (and likely coevolved) within a complex socio-ecological adaptive system."⁸

Biodiversity: "the variability among living organisms from all sources, including, inter alia, terrestrial, marine, and other aquatic ecosystems, and the ecological complexes of which they are part: this includes diversity within species, between species, and of ecosystems."⁹

Biodiversity surrogate: a representation of biodiversity. Surrogate metrics are often promoted to measure and account for biodiversity losses, recruited gains, and their equivalence.^{4,10}

Equivalence: when the measured losses and gains in biodiversity surrogates are the same in nature and magnitude.¹¹

Like-for-like or better rule: the recruited gains benefit either the same biodiversity surrogate as impacted by the development, or benefit another surrogate considered of a higher value (e.g., more threatened) than the impacted one.^{4,12}

Mitigation hierarchy: the mitigation hierarchy is a series of four steps to be followed during the life cycle of a project impacting biodiversity: avoid, minimize, remediate, and offset residual impacts. It is to be deployed when the options of renouncing to the project or selecting alternatives have been disregarded.^{2,12,13}

No net loss (NNL) or net gain: objective of the mitigation hierarchy and its offsetting step. The frame of reference against which NNL is to be evaluated (i.e., the counterfactual) should be specified to avoid unreasonable expectations in the actual achievements of the NNL objective.^{2,14}

Offset project: set of offset measures that ensure that residual impacts, if any, are compensated by equivalent gains. Gains are usually accrued after the permit has been granted, unless gains are accrued in anticipation of future losses via "banking."¹⁵

Polluter-pays principle: principle founded in welfare economics, proposing to internalize negative externalities induced by damaging activities into the market, via monetary compensations (taxes) set at the level of the lost values. The expression "polluter-restores," not commonly used, better reflects the transposition of the principle to biodiversity offsetting, where preferred compensations take the shape of restoration-related activities rather than monetary compensations.¹⁶

Regulatory offsets: offsets that are deployed for projects with significant impacts on biodiversity-related matters, as part of permit conditions under conservation-related regulations; for examples, see Sundseth and Wegefelt,¹⁷ the Australian Government,¹⁸ and the US EPA.¹⁹

Resilience: "the capacity to persist in the face of change, to continue to develop with ever changing environments."²⁰

Voluntary offsets: offsets that are not prescribed by law and deployed on a case-by-case basis, following a voluntary initiative of a party impacting biodiversity.²¹

KEY CONCEPTS OF OFFSETTING

Best practice suggests that offsets should follow the "like-for-like or better" rule and meet the "additionality" requirement (Box 1). In practice, offsetting uses biodiversity surrogates to measure losses and gains because the full set of components and processes that make up "biodiversity" cannot never be practically measured (Box 1). Different biodiversity surrogates (and their metrics) capture different aspects of biodiversity, ranging from utilitarian valuations to more ecocentric ones that attempt to capture ecological function or the maintenance of individual species.²⁸ In practice, surrogates used in regulatory offsets are often based on the components of biodiversity protected under conservation-related legislation, and are reflected in simple metrics, such as acres of suitable habitat for threatened species (e.g., US Endangered Species Act and French compensatory practices²⁹) or habitat hectares of native vegetation (Planning and Environment Act 1970 in VIC, Australia).³⁰ The choice of

surrogate has strong implications for the implementation of offset schemes; for example, the more ecologically complex a surrogate is, the more difficult it is to find an equivalent (like-for-like) biodiversity offset.²⁸

In the offset literature, two phases are commonly differentiated for reaching an NNL, measured through the relevant biodiversity surrogate. In the first phase, gains are recruited through initial on-ground management actions and, in best practice standards, the legal and physical protection of offset sites. Depending on the contextual conservation challenges (e.g., background trends, surrogates being offset, and legal obligations), gains are progressively accrued over time via three different strategies which we label A–C: approach A—the establishment of an ecosystem or ecological community in a location where it did not exist previously, an approach commonly used in wetland mitigation;^{31,32} approach B—the ecological restoration of degraded sites to their former ecological composition and function;¹¹ or approach C—averted (or avoided) loss, the removal of

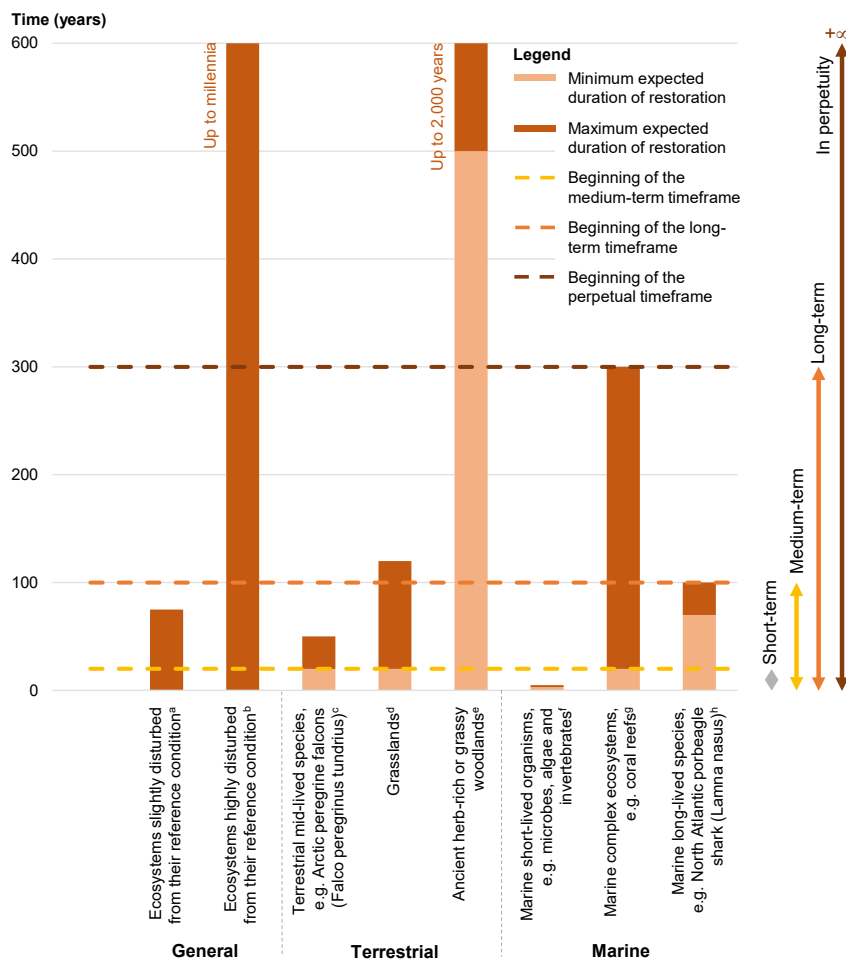


Figure 1. Examples of restoration and recovery time frames for ecosystems and species populations

The indicated time frames are the ones we propose based on the restoration literature (see [Tables S1](#) and [S4](#) for references). Ecosystem restoration and species population recovery and survival depend on the starting system state, reference condition, multiple social-ecological factors that are interconnected, and the influence of stochastic environmental events, including human-induced climate change (see [Table S4](#) for the references). ^aPotential full recovery within a human lifetime, with a global average life expectancy of 75 years; recovery depending upon availability of propagules and appropriate landscape-scale ecological processes. ^bReach millennia; probably not restorable but will likely form novel ecosystems. ^cDependent upon, for example, population density, habitat quality, and climate. ^dDependent upon, for example, nutrient loading, soil structure, and availability of propagules. ^eDependent on soil chemistry, mycology, and availability of propagules. Restoration a possibility for plant assemblages but questionable for rarer invertebrates and vertebrates. ^fDependent on amelioration of environmental stressors and availability of biological resources. ^gDependent on appropriate marine biological conditions and protection from environmental stressors; for example, habitat destruction and coral bleaching. ^hDependent on the implementation and enforcement of sustainable fishing practices, protection of habitat, and appropriate marine biological conditions.

threatening processes thereby avoiding declines in condition (e.g., averting weed invasion) or complete loss (e.g., avoiding land clearing).⁷ Approach B may involve ecological management and/or the (re-)establishment of traditional land-use practices.^{33,34} Despite limitations, approaches B and C remain the most common, and some offset policies combine them.^{7,35}

The second phase starts once sufficient gains have been recruited. The objective of this phase is to retain accrued biodiversity gains until the impacts of the authorized project cease.^{12,15} When moving to the retention phase, it is usually assumed that sufficient gains have accrued as measured by the biodiversity surrogate, and that the associated ecological components have become resilient and self-sustaining, with no (or minimal) human intervention, beside the continuation of traditional land-use practices when relevant.

Target-based offsets have been recently conceptualized as a way to better align project-level offsets with jurisdictional biodiversity targets.³⁶ This approach involves setting retention targets for given biodiversity features and specifying trajectories—“net gain,” NNL, or “managed net loss”—based on the states of biodiversity features relative to their targets. The offset actions (comprising of approaches B and/or C) are then calculated such that, with development and offsetting continuing, retention

targets will (theoretically) never be breached due to the amount of protection and/or improvement from offsets.³⁶ However, once calculated, offsets within this target-based approach still apply the same practices as current offset policies,

and thus still face the same challenges regarding the recruitment and retention of biodiversity gains over long periods of time.

In both the gray and academic offset literature, the terms “long term” and “in perpetuity” are commonly used in reference to the duration of the retainment phase, but often without being precisely defined. It is thus critical to clarify the range of time frames implicitly assumed by these terms when applied to offsetting activities; a task to which we now turn.

DEFINING THE TIME FRAMES OF BIODIVERSITY OFFSETTING

Here, we propose definitions for short-, medium- and long-term time frames, based on ecological considerations ([Figure 1](#)). Our proposed definitions are based on restoration time frames obtained from a diverse set of biodiversity surrogates described in the restoration literature: short term (<20 years), medium term (20–100 years), and long term (100–300 years); we take in perpetuity to mean more than 300 years or “forever more” (for references, see [Figure 1](#) and [Table S1](#)).

Using these restoration time frames ([Figure 1](#)), phase 1 (the recruitment phase) can range from a few decades through to beyond a century when recruiting equivalent gains for complex ecosystems and long-lived species. Conservation

legislation remains biased toward long-lived vertebrates (especially mammals and birds),^{37,38} as well as complex ecosystems and other biodiversity features that are in good condition, rare, and/or threatened.^{39,40} Consequently, surrogates generated for like-for-like offsets based on these biodiversity features are likely to require medium- to long-term time frames if recruited through approach B (restoration), and even longer under approach A (establishment of ecosystems). As demonstrated by the restoration literature, there is large variability in the time frames needed for restoration of ecosystems and species (Figure 1, and references therein). These range from slow-growing, high conservation value ecological communities (e.g., old-growth forests and species-rich grasslands), to biodiversity surrogates that can be restored or established over shorter time scales, such as dynamic ecosystems comprising fast-recovering species that can adapt to multiple habitats or thrive in modified habitats (Figure 1). Best practice offset guidelines also encourage the use of complex surrogates that require medium- to long-term recruitment time frames due to the complexity of, for instance, “species composition, habitat structure, and ecosystem function and people’s use and cultural values associated with biodiversity.”⁴¹ Regarding averted-loss offsets (approach C—the removal of threatening processes), if properly designed,⁷ this strategy could potentially accrue gains slowly or rapidly, depending on the likelihood of occurrence of the averted threat and its potential impact.^{42,43} However, little research has been done to estimate time frames for accruing gains due to averted-loss; therefore, we have relied solely on the restoration literature to define expected time frames.

These recruitment time frames bring ecological challenges. The recruitment of biodiversity gains for offsets involves working with a range of interconnected biophysical processes and functions, including nuanced species interactions that are variously subject to natural disturbance regimes overlaid with anthropogenic impacts, such as human-induced climate change and landscape transformation.^{44–46} In combination with limited ecological restoration and re-establishment knowledge,^{47,48} this results in significant uncertainties regarding both what biodiversity has been lost, and therefore what needs to be recruited, and whether recruitment attempts can deliver appropriate and equivalent biodiversity gains that can then be retained.^{11,49} These uncertainties imply that biodiversity gains from offsets will often be unlikely to fully compensate for biodiversity losses from development.^{11,49,50}

While the time frame of the recruitment phase (phase 1) depends on the biodiversity surrogate being offset and the actions being undertaken, the retention phase (phase 2) is bound by the duration of the impacts on biodiversity that generated the offset. In practice, many authorized impacts that trigger offsets are effectively permanent because of the type, duration, and magnitude of the disturbances they induce on biodiversity. The fact that only significant biodiversity impacts require a permit (and therefore offsets) to be legally authorized^{9,17,18,19} means that most impacts requiring offsets are thus by definition “significant” impacts and likely to result in long-term or permanent losses. For these cases, phase 2 (the retention of biodiversity gains) then needs to cover time frames in the order of centuries to meet any practical definition of in perpetuity. This also explains the stated preference for the perpetual protection of offset gains in

leading policies and offset standards.^{12,51} There have been institutional innovations in Australia and the US in attempting to strengthen the long-term protection of offset gains,^{32,52,53} and concerns have been expressed over the long-term protection of offset sites in Europe.^{54,55}

LONG-TERM GOVERNANCE IN GUIDELINES AND POLICIES

Here, we briefly review the time horizons specified in leading offset policies and best practice literature, and the range of recommended institutional arrangements mentioned in these sources to recruit and retain biodiversity gains, for the long term or in perpetuity.

Duration of offset obligations

Best practice guidelines and leading offset policies, from the US, Australia, and within Europe, vary in the time frames used for the recruitment and retention phases of biodiversity gains (Table 1). They tend to associate the recruitment phase (phase 1) with a time span of 5–30 years, and the retention phase (phase 2) with a time span of 20–50 years, which is often framed as long term (Table 1). These time frames align with policy cycles and life cycles of major development projects (Figure 2), but only correspond to short- to medium-term ecological time frames (Figure 1). Therefore, they do not match the long-term ecological time frames required to recruit or retain gains for long-lived and complex biological features that trigger biodiversity offsets (Figure 1). Based on our review, there is currently little to no engagement with time horizons expanding beyond 50–100 years within existing offset policies or within the best practice literature. The exception is the reference to the in perpetuity concept in Common law, mainly in the US and Australia, although the efficacy of the mechanisms deployed to achieve this are not well understood and have limitations.^{56,57}

In the next subparts, we expand on the existing and proposed mechanisms that the best practice literature has promoted to improve the recruitment and retainment of gains beyond a few decades. These mechanisms are also listed in Table 2, columns 1 and 2.

Legally securing the gains

Three legal instruments have been proposed to protect the biodiversity gains on offset sites from incompatible land uses over time (Table 2, “legally securing the gains”). Without these legal instruments, the offset measures to recruit and retain gains are solely bound to the permit conditions of the development project and associated contractual obligations, and thus, are at risk of lapsing once the project’s contract ends. The proposed legal mechanisms rely mainly on offsetting experiences from the US and Australia (Table 2, “legally securing the gains”) and include: (1) the transfer of land ownership rights to the state, to transform an offset site into a publicly accessible conservation reserve, preferably associated with a land stewardship agreement that supports appropriate management practices; (2) the transfer of land to a conservation organization associated with deed restrictions; and (3) the use of conservation easements (US) or covenants (Australia) that protect biodiversity gains on private property, and facilitate any management and/or activity

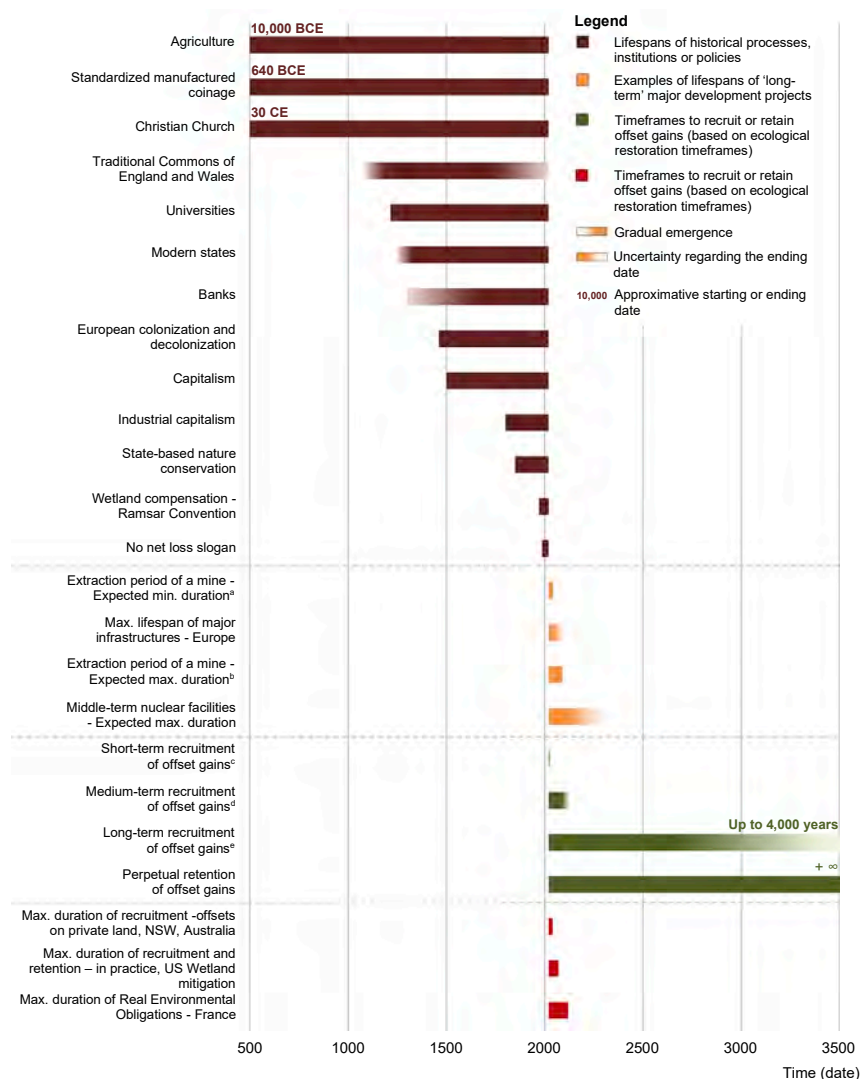
Table 1. Summary of the specifications of temporal duration for offset recruitment and retention phases from leading offset policies and guides

Duration of the recruitment phase	Duration of “long-term” and/or the retention phase	Duration of perpetual retention
United States: wetland mitigation rules under the Clean Water Act		
Until the performance standards have been met and monitoring requirements have been fulfilled	the period following the recruitment phase; in practice, 10- to 50-year time frame; alterations to compensatory mitigation projects permitted on public land in case of incompatible uses, if provision of alternative compensatory mitigation	forever (easements in some states); legal discussions regarding the perpetual nature of easements
Australia (federal): EPBC Act offset policy		
Case-by-case approach	for at least the full duration of the impact; impact on federal offset sites permitted if provision of a new offset package	N/A
Australia (Victoria): private land offsets		
10 years	beyond 10 years	forever (covenants applied in perpetuity, yet subject to mineral exploration and mining exemptions)
Australia (New South Wales): on-title biodiversity stewardship agreement		
20 years (can be extended)	beyond 20 years	forever (deeds applied in perpetuity)
France: first- and third-party offsets		
Case-by-case approach; for infrastructure projects, the duration of the concession contractually determines the maximum duration of the offset obligations (25–30 years); third-party offsets: agri-environmental schemes usually renewed every 5 years, with longer contracts being discussed	legally, as long as the impacts remain; in practice for infrastructure projects, bound by contractual offset obligations, unless the site is granted some form of public conservation protection, or benefits from an environmental real obligation on private land (99 years maximum)	perpetual contractual engagements prohibited by law
France: first four pilot supply offsets (compensatory natural sites)		
30 years (active management)	no contractual obligations for active restoration, yet various solutions proposed to pursue the ecological objectives of the sites beyond 30 years	N/A
Germany: compensation pools		
25–30 years (active management, under the responsibility of those who caused the damage)	the period following the active management phase	ideally should permanently protect sites and measures
UK DEFRA leading Pilot Offset projects (Essex and CSWAPO)		
N/A	20–25 years (long-term management)	no definition (Essex) or “a minimum of 30 years” (CSWAPO)
The European REMEDE Toolkit		
N/A	N/A	50–75 years
The World Bank’s biodiversity offsets user guide		
Case-by-case basis, with the proponent supporting the up-front investment costs of the offset site	at least the operating life of the original project and ideally longer, with the proponent responsible for the first few years of the recurrent offset costs only	forever (funded via public conservation funding, philanthropy, or other non-additional funding)

In many jurisdictions, diverse types of offsets and offset mechanisms may be deployed within an offset scheme. Here, we only report the cases where offset schemes or some of their mechanisms specify or imply specific temporal durations for offset recruitment and retention. Many schemes tend to conflate the long-term with the retention phase, with limited specification of what long-term means. See [Table S2](#) for references.

restrictions in perpetuity, meaning legally (in Common law) and literally forever.^{56,57} Yet, perpetual protection may not be always perpetual in practice. There may be significant resourcing short-

falls, arrangements may be subject to exemptions, and management and monitoring may be non-existent in practice, and non-compliance can go undetected^{53,57,58} ([Table 1](#)). The feasibility of



currently the most common approach embedded in leading offset policies in the US, Australia, and within Europe, where ecological consulting companies, offset “banks,” private landholders, and/or the state (for example, in the case of public-land offsets) are empowered as offset service providers. Best practice literature has promoted adaptive management based on Western ecological knowledge, with plans that include performance standards and targets. More recently, in some contexts, such as Canada, traditional or Indigenous land management practices that benefit biodiversity have also become a possible form of offset services.³⁴ In both cases, the literature recommends to secure management practices via various management contracts or obligations,

long term and in perpetuity protection of offset sites also depends on the legal and customary norms regarding property rights, contractual obligations, and land management in different jurisdictions. For example, France, a Civil law country where perpetual contractual engagements are illegal,⁵⁹ has introduced Environmental Real Obligations that, once established, can bind and guide private landholders in their land-use practices for a maximum of 99 years (Table 1). Yet, these time frames may discourage landholders from engaging with offset service provisions, notably farmers given their constraints and usual reliance on short-term contracts.⁶⁰

Ensuring effective management

Two approaches have been proposed to recruit and retain gains: offset management services and the funding of land-use transitions (Table 2, “ensuring an effective and efficient adaptive management”). In the first approach, offset service providers are paid to manage the sites to recruit the gains over a specific time period and, when relevant, continue some level of management to retain gains as long as required (e.g., long-term weed control). This is

ideally included in a covenant/easement for private land, or via stewardship agreements for public land.

The second approach proposes to invest in land-use transition as a form of offset. For example, Investment Payments for Ecosystem Services have been proposed in Europe to support farmers transitioning to organic agriculture, inspired by traditional land uses that enhance biodiversity.³³ In contrast to the first approach, payments cease once the transition is complete. For farmers targeted by this approach in Europe, the costs of retaining gains then become part of the farm’s ongoing business model.³³

In both approaches, ongoing independent monitoring, evaluation, auditing, and reporting of offset gains are recommended.^{4,15} Best practice literature encourages ecologists, conservation scientists, or public authorities to conduct this evaluation and provide support to offset service providers, including expertise and research. It is also argued that offset-related data should be transparent and made available on publicly accessible offset registers to improve assessment, inform public debates, ensure accountability, and enable public

Table 2. A review of the legal and institutional mechanisms used or proposed to recruit and retain offset gains based on long-term governance needs, and their identified long-term challenges

Land security	Recruitment and retention of gains	Identified long-term risks and challenges
Legally securing the gains		
● Maintaining accessible land registry records ● Building social acceptability of the offset sites at the landscape level	N/A	state and civil society: costs of developing long-term institutional resilience and manage land-use conflicts, costs of offset archives and of preserving the collective memory of the sites ^a
On public land		
Binding agreements integrating offset sites to networks of publicly protected zones	land stewardship agreements with public authorities	● possibly porous boundaries between conservation and offset activities^a ● legal limitations of setting up binding contracts beyond a few decades in some jurisdictions ● state: cost of reviewing and approving contracts^a
On private land		
Covenant/perpetual conservation easement or transfer to biodiversity conservation organization with deeds restricting land uses	● inclusion of management obligation in covenants, deeds, easement, and offset services contracts ● management as part of the business model for Investment ipayments for ecosystem services	● possibly porous boundaries between conservation and offset activities^a ● legal limitations of setting up binding contracts beyond a few decades in some jurisdictions ● state: cost of reviewing and approving contracts^a
Ensuring an effective and efficient adaptive management		
Ongoing adaptive management		
N/A	● long-term adaptive management plans with performance standards and targets and/or continuation of traditional land-use practices ● scientific support ● public access to data	● state: costs of reviewing and approving, management plans, and of making the documentation publicly available^a ● state, research bodies, and/or civil society: costs of providing support and producing scientific knowledge^a ● long-term ecological uncertainties
Monitoring on-ground practices		
N/A	● mandatory reporting ● independent monitoring and evaluation ● public access to data	state, research bodies, and/or civil society: costs of evaluating management, of publishing evaluations, and of legal pursuits ^a
Securing payments for services		
Securing the capital		
N/A	● appropriate budget planning for management and monitoring ● fund establishment: fund established by up-front payment (preferred) or incrementally (e.g., sinking funds or revenue transfers) ● fund maintenance: participation in public, or private endowment fund	● state and civil society: costs of building the expertise that can estimate intergenerational offset budgets, and the long-term institutional safeguards against the capture of capital^a ● funds: risks of losing value through time, e.g., underestimate budget, investments in risky assets, economic or Anthropocene-related shocks

(Continued on next page)

Table 2. Continued

Land security	Recruitment and retention of gains	Identified long-term risks and challenges
Securing safeguards for unexpected changes and guarantees against risks of financial or ecological failures		
Dynamic conservation easements	• multipliers (covering time lags and uncertainties) • financial surety instruments against failures of the proponent (e.g., performance bond, surety bond, insurance bond, bank guarantees) • financial surety instruments against financial or ecological failures of the offset project (e.g., adaptable insurance schemes, insurance pools)	• Anthropocene-related uncertainties: failure of the surety providers, uncertain legal liabilities of retaining gains, reluctance of insurances to cover long-term environmental risks; • state: costs of establishing institutional safeguards against the instrumentalization of dynamic conservation easements^a
Monitoring financial budgets, safeguards, and guarantees		
N/A	• fund management: independent, irrevocable, and accredited trust funds or public agencies • reporting and monitoring of investment policy, of management budget plans, and of financial surety • dedicated resources for legal defense or participation to a legal defense fund	state and civil society: cost of reviewing and monitoring financial reporting and of legal pursuits ^a

Columns 1 and 2 summarize the propositions made in the academic and gray literature devoted to offset best practices (see Table S3 for references). Many of these propositions are inspired by the experience of offsetting in common law countries and may not suit in countries with other systems of law. We did not report the propositions that violate the additionality principle in these columns. Column 3 lists the long-term risks and challenges that we have identified as overlooked while reviewing the literature.

^aThis would breach the additionality principle if conservation and offset activities are not properly differentiated and sufficiently funded.

scrutiny.^{4,12,61} In practice, only a minority of countries and states have adopted consistent publicly accessible offset registers.^{62,63} Little to no formal monitoring and evaluation of offsets are currently being deployed as part of offset schemes, leading to a limited evidence base for determining the efficacy of existing offset schemes.²⁵

Securing payments for offset services

Legally securing gains from offsetting and ensuring appropriate ongoing management and monitoring requires secure funding over decades, and potentially more than a century, if ecological restoration time frames are considered (Table 2, “securing payments for services”). Without secure offset funding, the longer-term costs are effectively externalized onto landholders, public and private conservation organizations, and future generations. This potentially results in crowding-out effects due to blurred boundaries between offsetting activities (intended to compensate for losses) and public or private conservation activities (intended to deliver gains).⁶⁴ This could discourage voluntary conservation efforts or, more critically, undermine the additionality of offset gains, and therefore reduce the ability of offset schemes to deliver NNL of biodiversity over the long term.^{64,65}

Inspired by existing policy mechanisms, and experiences from mine closures and long-term pollution management, the best practice literature has focused on better anticipating these costs, mainly through promoting Trust Funds. Some have argued that Trust Funds should be independent and accredited, to properly track the allocation of offset funds (accountability) and avoid cost shifting, i.e., the use of offsetting funds to displace funding for conservation or other activities.^{4,66} Others

have recommended sufficient initial investments to create Endowment Funds, which potentially generate income as long as the stock market functions.^{55,67}

Best practice reports also recommended financial surety instruments as safeguards for unexpected changes and guarantees against risks of financial or ecological failure, notably in Europe⁵⁵ (Table 2, “securing payments for services”). Among them, environmental insurance tools are already applied to manage mining pollution risks; yet they remain relatively new, are less regulated than other types of insurance, and might be limited for projects expanding beyond 10 years.⁶⁸ The peer-reviewed literature also promotes the use of multipliers to manage risks, notably regarding socio-political uncertainties, time lags, and additionality.^{69–71} Importantly, strong legal structures of checks and balances to control financial budgets, safeguards, and guarantees have been recommended, including resources dedicated to legal defense and detailed financial reporting and monitoring, in addition to independent accredited Trust Funds (Table 2, “securing payments for services”).

In practice, the costs of recruiting and retaining offset gains remain underestimated, even for short-term time frames.^{4,54} For example, in VIC, Australia, the planned budget for the recruitment of offset gains covers a 10-year management period,⁷² following which offset management activities fall back on pre-existing resources. A few countries and states have introduced mechanisms to secure funding for initial management costs, as well as, in some cases, some retention costs “for the long term.” This includes the mandatory financial backing of “compensatory pools” (mitigation banks) in Germany for a minimum of 25–30 years,⁷³ endowment and maintenance funds for

mitigation banks in the US,³² or the Biodiversity Conservation Trust in NSW, Australia, which has set up a Biodiversity Stewardship Payment Fund aiming to provide an in perpetuity funding source.^{52,74}

CRITICAL REVIEW AND PATHWAYS TO MOVE FORWARD

After identifying the approaches currently proposed and/or implemented for accruing and retaining biodiversity gains over “long” time frames, we now undertake a critical review of these propositions. In this section we first present the political imaginary that these approaches are derived from and perpetuate. We then discuss the implications of this imaginary. Each subsection below starts by identifying the major omissions and shortfalls from these approaches—and the imaginary they convey—and then ends by discussing potential ways forward.

Most of the proposed long-term biodiversity offset mechanisms apply a weak ecological modernist political imaginary to the realm of biodiversity offsetting.^{3,75,76} The narratives of weak ecological modernization promote technocratic approaches (technology, markets, and management) as solutions to decouple the economy from its environmental impacts.^{3,75,76} They struggle to engage with ecological limits and socio-political complexities, including deliberative democracy and the diversity of place-based bonds between local communities and the biosphere.^{3,75,76}

Similarly, existing offset schemes and much of the best practice offset literature implicitly assumes that development can be decoupled from its biodiversity impact via technocratic approaches. They conceptualize biodiversity as gains that are assumed to be able to be produced over the long term by offset service markets or investments, retained on bounded offset sites and monitored by private entities, the state, and their experts. In doing so, they fail to engage with the ecological complexity and socio-political implications of this “production” (Table 2, column 3).

The polluter-pays principle and intergenerational costs Omission

The best practice literature omits the long-term retention and governance costs needed for effective offsets. Consequently, these costs are imposed on conservation organizations, the state, research centers, and civil society.

One challenge for biodiversity offsetting is to ensure that the polluter pays the full cost of repairing the damage they cause. In the offset context this means internalizing the costs of both recruiting and retaining biodiversity gains, often over the long term. Yet, the World Bank’s best practice offset guide highlights that “many developers ... are only willing to support the up-front investment costs of the offset area (and maybe the first few years of recurrent costs), but not all the recurrent costs in perpetuity”;⁶⁷ and thus advises that conservation resources should be relied upon for the long-term retention of gains.⁶⁷ Reliance on conservation-related institutions to pursue the ecological objectives of offset sites beyond a few decades is currently widespread (Table 1). This inevitably breaches the additionality principle (Box 1) by diverting future resources from conservation activities to the long-term retention of offset gains that, at best, have a net

neutral impact on biodiversity when losses from development that generate the offsets are properly accounted for.

Furthermore, while best practice guidelines indicate that polluters should cover the long-term on-ground management and monitoring costs (Table 2, column 2), they do not engage with the governance costs that the proposed mechanisms impose on public authorities and civil society (Table 2, column 3). Institutionalizing best practice mechanisms effectively requires significant additional resources for factors, such as the controls, research, and stewardship building required by these mechanisms (Table 2, column 3). This also risks diverting resources away from conservation, as is already observed in some countries.⁷⁷

The nuclear sector can act as a template for estimating the costs of long-term retention and some elements of the governance of offsets. For example, the nuclear industry already includes control costs and investments in research and technology in its estimation of the long-term waste management costs, to be paid by nuclear waste producers in some contexts.⁷⁸ Taxes on nuclear facility installation have also been used to fund additional research and studies in France;⁷⁹ and fees have already been introduced in Sweden to cover the costs of historical nuclear waste production.⁸⁰ Various institutional arrangements exist in leading countries to ensure that nuclear polluters contribute to covering the funding of public agencies, trusts, or companies dedicated to long-term management of nuclear waste.^{79–81}

Making the polluter pay remains both a technical and governance challenge in both nuclear and extractive sectors. Costs can be underestimated when setting up the payment mechanisms due to a lack of knowledge regarding the actual long-term costs,⁸² long-term economic or regulatory uncertainties,⁶⁸ or poor environmental governance and regulations.^{83,84} Nevertheless, payments can be readjusted across time to correct past misestimates.⁸⁰ Importantly, initial investments or regular payments can also be disputed or purposely underestimated when both the proponent and public authorities embody a preference for the present and refuse to adopt costs, payments, or long-term financial assurances that would question the financial feasibility of a development project.^{68,79}

Ways forward

Investments that are robustly additional to current conservation efforts are required to expand the control, research, and stewardship capacities of the state and civil society. These investments could be internalized in the costs of biodiversity offsetting, by potentially adapting methods and mechanisms already applied in other long-term sectors (e.g., nuclear and extractive activities). For target-based offsets, compensation ratios—proposed for some economic sectors to contribute toward biodiversity targets on top of compensating for a given project³⁶—could also be used to recover the costs of historical impacts on biodiversity, or to correct past misestimations. Structural governance changes are needed to overcome the preferences for the present that undermine the polluter-pays principle. Appropriately pricing offsets with long-term costs and financial assurances would serve as a price signal to indicate that development projects that cause irreversible biodiversity loss and intergenerational injustices are too high a cost to be approved. Internalizing

the long-term consequences of present-day decisions could enable a greater emphasis on project renouncement, considering alternatives, and enacting the avoidance step of the mitigation hierarchy.

Grappling with dynamic ecosystems in the Anthropocene *Omission*

By conceptualizing biodiversity as a fixed entity that can accrue gains, current best practice approaches to offsetting do not engage with the dynamic dimension of ecosystems over the long term, nor the ecological and legal implications of the Anthropocene (Box 1).

Ecosystems are dynamic and subject to natural (e.g., speciation) and human-induced environmental change that can result in systems that comprise ecological novelty with no historical analogue.⁸⁵ The ecological time frames involved, coupled with the Anthropocene, bring into question the capacity to recruit and retain equivalent gains because of possible major shocks from extreme climate events and other landscape changes caused by human-induced climate change, or the direct anthropogenic drivers of biodiversity depletion. Therefore, while the objective of offset sites is to achieve NNL of specific species or ecological communities, this may not be ecologically feasible. Over longer time frames—particularly in view of the effects from anthropogenic climate change—recruited biodiversity gains on offset sites may no longer be directly comparable to the surrogate and corresponding ecosystem type that were lost, potentially becoming a hybrid or novel ecosystem.^{85,86}

These ecological uncertainties have legal implications that may undermine the institutional capacity to secure compliance. Landscape changes may threaten the legal liabilities of service providers to recruit or retain accrued gains. While insurances are proposed to mitigate liability risks (Table 2, “securing payments for services”), some of the risks of failure may become uninsurable due to climate change and the increase in frequency of extreme weather events (for a discussion on possible consequences of climate change on insurances in general, see Wouter Botzen⁸⁷ and the Reserve Bank of Australia⁸⁸). In the US, some have proposed more flexible legal arrangements, such as applying the Charitable trust principles to perpetual conservation easements⁸⁹ or establishing dynamic conservation easements to secure new offset sites if values on the original offset sites have degraded.⁹⁰

Ways forward

The best practice literature needs to better engage with the dynamic dimensions of recruited gains. For example, the potential effects of anthropogenic climate change need to be addressed at the forefront of discussions on offset projects and their management plans, not as an afterthought. In addition, further ecological research is needed to clarify within which time frames, and under which conditions, biodiversity surrogates legally subject to offsetting in different jurisdictions can be recruited and retained over time, considering the ecological uncertainties imposed by climate change, and more broadly, the Anthropocene. This research could help assess the feasibility of reaching NNL for different surrogates and clarify which projects would likely result in a net loss of biodiversity, despite offset efforts. Further research is also needed in different jurisdictions to clarify

the legal liabilities of offset service providers in rapidly changing landscapes. While some more flexible arrangements might be promoted to engage with long-term ecological uncertainties, strong institutional safeguards need to be built to avoid their instrumentalization for short-term land-use interests. For long-term or permanent offsets, collective reflections are also needed regarding how offset sites can support the dynamic and varying processes of biodiversity.

Governing for the long term in the Anthropocene *Omission*

Current offset schemes and best practice guidelines are shaped by and for current Western politico-economic systems. They struggle to consider time horizons beyond 50–100 years and consequently are ill-prepared for the institutional implications of governing offset gains for the long term.

Current Western politico-economic systems, including capitalist economies and modern representative democracies, are not structured to consider the consequences of present-day decisions on the long-term future (over one or more centuries).²⁶ More fundamentally, modern liberal democracies, born in Europe, have constructed themselves through the rejection of European traditions and the idea that the present should be sacrificed for future salvation.²⁷

Blind to long-term concerns, they are structurally driven by cultural, economic, and political stochastic changes, responding to financial time frames, political cycles, and planning forecasting that vary from the very short term (a few months to a few years) to the short term (up to 20 years), from an ecological standpoint (Figure 1). This preference for the present is embodied, for example, in the continuous extension of temporary storage for high-level radioactive waste resulting from the operation of commercial nuclear power plants in many countries since the 1950s, and the absence of countries with an operating deep geological disposal facility, albeit the recent progress in Finland and Sweden.^{82,91} Biodiversity conservation has also been shaped by these institutional time frames. Long-term research and on-ground restoration projects rarely expand beyond 10–15 years.^{92–94} It is thus not surprising to find similar institutional time frames in current offset policies and guidelines (Table 1; see also Figure 2, rows 14–24, for a few examples).

Ecological time frames necessary to recruit and retain biodiversity gains for some complex offset surrogates reach the time frames of historical periods or potentially even civilizations, if they are to account for permanent loss of some components of biodiversity (Figure 2). Furthermore, it is likely that the Western politico-economic systems and their key institutions (i.e., markets, the state, and expert bodies) will experience significant transformations or even disappear within the time frames required to recruit or retain these complex offset gains. Human institutions are not static entities—they emerge, evolve, merge, and disappear. The Western institutions that gave birth to the current Western politico-economic systems (Figure 2, rows 3–11) are relatively young from an ecological perspective. Other institutions are older—many Indigenous and traditional cultures across the globe have long-established and resilient institutions, some of which have successfully protected sacred natural sites and sustainably governed common-pool natural resources for centuries, and in some cases, for millennia.^{95–100} Yet, these

institutions often continue to be disregarded, marginalized, or undermined by Western formal institutions, and the field of conservation.^{99–103}

Institutional changes are also likely to accelerate with the unfolding of anthropogenic environmental shocks (such as severe anthropogenic climate events or biosphere disruptions) as societies are forced to undertake transformative institutional changes or experience major unpredictable instabilities in existing social-ecological systems.^{104–106} Such changes have already been observed: some institutions are adapting,⁹⁹ new forms of governance and institutions are emerging,¹⁰⁷ and new informal, collaborative actions are being deployed outside formal Western institutions.¹⁰⁸

Despite this changing long-term context, the offset literature proposes mechanisms that are highly reliant on current formal Western institutions, implicitly assuming the future stability of these relatively young institutions over the long term. We argue that this assumption is unreasonable for long-term and perpetual offsets and might also become unreasonable under shorter time frames because of accelerating instabilities due to the Anthropocene. For example, severe economic recessions can consume the principle of secured funds.⁶⁸ More extreme shocks (due to, for example, severe climatic events, global pandemics, or wars) may also threaten the capacity of the modern state or markets to function, and even the potential collapse of Western global civilization is currently being debated.^{109,110}

Ways forward

Supporting changes in offset policies that incorporate multi-decadal and century-plus time frames would be a step forward. Yet, solely relying on short-lived Western institutions to secure the long-term governance of offset gains remains risky. In our view, the offset literature, policies, and practitioners could better engage in how to improve the resilience (Box 1) of offset-related institutions. Genuine, rather than instrumental, discussions between formal offset-related institutions and long-lived, resilient Indigenous and traditional governance systems could contribute to facilitating the long-term recruitment and retention of biodiversity gains. For example, offsets could be integrated into existing long-lived Indigenous and traditional social-ecological institutions. However, care needs to be taken to ensure that the additionality and polluter-pays principles are maintained, and that offsets do not destabilize these complex institutions. In addition, deeper structural reforms are required for long-term concerns and long-term governance to be considered in formal Western institutions, democratic debates, and deliberations across scales, notably when planning and development proposals are discussed (for propositions, see Rosanvallon,²⁷ Bourg,¹¹¹ and Takacs¹¹²). In many contexts, engaging with Indigenous and traditional norms, knowledge systems, institutions, and land rights claims should be essential in these structural transformations.^{99,102,103}

The socio-political dimension of offset governance Omission

Relatively few sources in the offset literature have grappled with the socio-political complexities of governing offset gains. Considerations discussed in the literature solely include how to better engage stakeholders in the offsetting process, “building

acceptance” and maintaining good relationships with properties surrounding offset sites.^{12,53,113}

The imaginary embedded in offset best practice literature risks repeating some of the past mistakes of the conservation field, which historically framed nature as “wild” objects that could be locked in bounded parks, placed under the control of experts and away from local communities.¹¹⁴ Despite progress, the conservation field continues to struggle with engaging the human dimension of conservation—notably with formal, informal, and customary rules, social practices, power dynamics, forms of knowledge, values, place-based social-ecological relations, and complex politics across scales.^{107,115,116} Similar struggles were observed in the offset literature. Yet, these socio-political dimensions are yet to be seriously addressed. For example, human conflicts over land use and access to natural resources are affecting biodiversity and its conservation;¹¹⁷ protected areas, while promoted as the strongest form of protection over the long term,¹¹⁸ have seen their protection status being degraded in some contexts^{119–121} and their achievements being affected by human activities in their surroundings.¹²² Perpetual conservation easements have already been challenged under development pressures in the US.⁵⁶ It is to be expected that offset sites risk experiencing similar challenges that could, if not anticipated, lead to the loss of recruited gains.

Ways forward

Approaches to the governance of offset sites must be expanded to build in the long-term stewardship of offset gains and to prepare for potential future land-use conflicts. We encourage the field of offsetting to collaborate further with social scientists and the humanities, public authorities, Indigenous peoples, and civil societies to accelerate transfer of the lessons already learnt regarding social-ecological resilience, democratic deliberation, and conflict management. The many learnings within conservation (and beyond) that could be applied, include conflict resolution and collaborative governance,¹¹⁷ common-pool resources management,^{101,123} stewardship,¹²⁴ values,^{125,126} justice,¹²⁷ ecological democracy,¹¹² partnerships between different knowledge systems,¹⁰³ and biocultural diversity.⁸ The use of deliberative platforms could enable communities and societies to explicitly discuss and refine the knowledges, actors, and institutional rules to be deployed to retain the recruited offset gains. This could help societies anchor the offset sites within their social-ecological landscapes and institutions, manage conflicts between actors, and adapt to social-ecological changes across time. Importantly, efforts to build these platforms or adapt existing ones need to be additional (yet, potentially complementary) to conservation, with their costs being factored into the estimation of offset costs.

CONCLUSION

We present an analysis of biodiversity offsetting mechanisms proposed by the best practice literature, and in use by current offset schemes, to govern offset gains over long-term time frames. While current governance mechanisms are theoretically tailored for biodiversity gains to be recruited and retained over a few years to a maximum of a few decades, these time frames do not match most ecological time frames needed to reach>NNL. In practice, many offsets are likely to require governance for over a

century, and in some cases, millennia, to recruit and retain biodiversity gains that offset the equivalent (significant and often permanent) biodiversity losses. However, the time frames that current Western institutions operate under, on which offsets are based, cannot ensure the longevity of these institutions. Therefore, we recommend initiating a process of incorporating long-term considerations in offset policies and of building institutional safeguards to ensure that the polluter-pays principle is properly applied to offsetting; factoring in the long-term retention, governance, and stewardship costs into the payments to be paid by the polluters. Finally, we argue that offsetting should not be discursively sold by default as delivering NNL. In our view, current NNL approaches, at best, temporarily reduce permanent damage by making polluters partially accountable for their impacts and by providing clear targets to operationalize offsets in the short to medium term. At worst, current approaches to offsetting participate in a false promise, which distracts institutional efforts from much needed transformative change centered on renouncing impactful projects, considering a greater range of alternatives, and a greater emphasis on avoidance in the mitigation hierarchy.

EXPERIMENTAL PROCEDURES

Resource availability

Lead contact

Further information and requests for resources should be directed to the corresponding author, Florence L.P. Damiens (florence.damiens@rmit.edu.au).

Materials availability

All sources used in this Perspective are listed in the References or in the Supplemental information. All sources were publicly available at the time of the analysis; however, most academic publications are behind journal paywalls.

Data and code availability

All data and sources used to produce Tables 1 and 2 and Figures 1 and 2 are available in the Supplemental information. Figures 1 and 2 were generated in Excel and PowerPoint, Version 2011.

SUPPLEMENTAL INFORMATION

Supplemental information can be found online at <https://doi.org/10.1016/j.oneear.2020.12.012>.

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AUTHOR CONTRIBUTIONS

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Quantifying peatland land use and CO₂ emissions in Irish raised bogs: mapping insights using Sentinel-2 data and Google Earth Engine

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Ireland has > 50% of the EU's ocean-raised bogs; however, degradation through land-use activities has transformed them from carbon (C) sinks to sources. Given their significant role in climate mitigation, it is essential to quantify the emissions resulting from land use degradation of these ecosystems. A seven-class land-use classification system for Irish peatlands (LUCIP) was developed and mapped using Sentinel-2 imagery, random forest machine learning and Google Earth Engine. The results revealed that agricultural grassland comprised 43% of the land use on raised bogs, followed by, forestry (21%), cutover (11%), cutaway (10%) remnant peatlands (13%), waterbodies and built-up ~1% each. The overall accuracy of the map was 89%. The map was used to estimate CO₂ emissions for four classes constituting 85% of raised bogs: cutover, cutaway, grassland, and forestry using the IPCC wetlands supplement and literature-based emission factors, we estimated emissions at ~1.92 (±1.58–2.27 Mt CO₂-C-yr⁻¹) and ~0.68 Mt CO₂-C-yr⁻¹ (±0.44–0.91 Mt CO₂-C-yr⁻¹) respectively. This is the first study to spatially quantify land use and related emissions from raised bogs. The results have revealed widespread degradation of these globally rare habitats, making them net emitters of CO₂. The map is vital for the conservation of these ecosystems through restoration efforts, and the methodology can also be applied to other regions with similar peatland land use issues.

European peatlands cover approximately 60 million ha^{1,2}, and a substantial proportion of this has been degraded by unsustainable land use practices, such as agriculture, forestry, and peat extraction. Consequently, almost 44% can no longer accumulate peat³. Tanneberger et al.⁴ indicated that degraded peatlands in the European Union (EU) represent half of the globally degraded peatlands. In Ireland, peatlands cover ~1.46 million ha (21% of Ireland) and consist of two types of bogs: blanket bogs (~900,000 ha) and the globally rare Oceanic raised bog (~530,000 ha)^{5,6}. It is estimated that they store between 60 and 75% of the national Soil Organic Carbon (SOC) stock^{7–9} but land use practices have led to the degradation of about 95% of these peatlands^{8,10–13}.

These land use activities harm the hydrological and ecological functioning of peatland ecosystems, turning them from a net sink to a source of C¹⁴. It also results in a consistently lowered water table, which accelerates peat decomposition, releases dissolved organic carbon (DOC) and particulate organic carbon (POC) and alters carbon and greenhouse gas (C and GHG) fluxes^{15,16}. Hence, these ecosystems, which in their natural condition are significant C stores and are crucial to the prevention of natural disasters such as landslides, fires, and floods¹⁷, become susceptible to them^{18–20}. Despite this, Irish peatlands still contribute to various hydrological and ecological functions and cultural, and socio-economic values^{6,21}.

The land use practices on peatlands in Ireland are similar to those in Europe, including drainage for industrial and domestic peat extraction, agriculture (mostly grasslands), afforestation and infrastructure development (roads, wind farms, airports etc.)^{12,22,23}. As a result, it is estimated that less than 1% of raised bogs in Ireland are actively forming peat as of 2017²⁴. This is particularly due to the intensification of land use through industrial peat extraction, afforestation and agriculture, which is a relatively recent development (since the 1940s), but has caused more damage in a short period of time²². The establishment of Bord na Móna (BnM), a semi-state-owned

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company, in 1946 for industrial peat extraction had a notable impact on raised bogs. Approximately 90% of the BnM landholdings are situated on raised bogs, and the majority of those (~90%) have been drained and/or opened for peat extraction⁶². BnM ceased extraction activities in 2021²⁵, however, there are still several medium-sized companies engaged in industrial peat extraction, including Harte, Klasmann-Deilmann, Bulrush, Clover, Erin, and Westland, as well as ~30 other small producers^{11,14}. Coillte, a semi-private afforestation company established in 1989, has afforested approximately 31,000 ha of raised bogs. The provision of grants through the Common Agricultural Policy (CAP) for the reclamation of raised bog edges for agriculture has also contributed to the intensification of land use in these ecosystems. However, spatially explicit data on the extent of these activities (especially non-BnM industrial activities) and domestic peat extraction activities is non-existent²⁶. The absence of such data prevents accurate quantification of emissions from managed peatlands and hinders the formulation of effective conservation strategies.

As a signatory to the United Nations Framework Convention on Climate Change (UNFCCC), Ireland has an obligation to report and account for its GHG emissions and removals and meet its emission targets for Land Use, Land Use Change, and Forestry (LULUCF), including wetlands, as outlined in the EU's 2030 climate change framework²⁷. Several studies have been conducted on Irish raised bogs at small spatial scales to gain insights into the effect of land use conversion activities on C and GHG dynamics, such as losses through land, atmospheric, and fluvial emissions^{28,29}. These local-scale effects can have regional and global consequences; yet information on land use status and associated emissions from these ecosystems remains poorly understood at the national, regional, and global levels³⁰. To propagate local-scale emission measurements to a national scale and accurately account for peatland emissions, spatially explicit information on peatland land use is essential^{14,26}. Andersen et al.³¹ emphasise the importance of land use/cover data in understanding degradation and restoration. However, national and global land-use/cover maps often exclude activities such as peat extraction, forest and abandoned peat extraction sites⁴. This makes these datasets inadequate for understanding degradation through land use, monitoring conservation activities (rehabilitation, restoration, and rewetting), and assessing C and GHG emission dynamics.

To report emissions from wetlands, the Intergovernmental Panel on Climate Change (IPCC) has proposed a system consisting of three tiers: Tier 1 (T1) includes default EF and is specifically for wetlands and Tier 2 (T2) EFs are country specific and based on the emission data from case studies. The Tier 3 (T3) EFs use more complex and dynamic models. The default T1 EFs are derived from limited data available from sites with different geographical, climatic, and ecological conditions. Ireland reports emissions from peatlands based on T1 EFs except for industrial peat extraction sites and forests on drained peatlands, where country-specific EF values are being used³². However, the reliance on coarse spatial resolution (25 ha) CORINE (Co-ordinated Information on the Environment) land cover data and non-spatially explicit information for reporting purposes make the national emission estimates less accurate. Given these limitations, it is essential to develop peatland-specific land use maps that can be used for more accurate upscaling of emissions from site to regional, national, and global scales using IPCC methods. Furthermore, these maps are vital for supporting conservation activities, sustainable land management practices, and policy-related decision making.

This study aims to map the much-needed spatial distribution of land use on raised bogs in Ireland and quantify the corresponding C and GHG emissions^{5,33,34}. The spatial extent of raised bogs was based on the DIPMv2 (Derived Irish Peat Map version 2), which is the latest peatland extent map integrating data from multiple sources⁵. Spatially explicit information on land use can be obtained using remote sensing methods. However, the persistent cloud cover inherent to the temperate maritime climate of Ireland poses a challenge to the acquisition of frequent cloud-free optical remote sensing images³⁶. Consequently, it is particularly difficult to map national-scale land cover and land use. Previous attempts to map land cover at a national scale in Ireland have encountered similar difficulties and full coverage has not been achieved^{36–39}. Connolly¹² successfully mapped industrial, grassland and forestry on peatlands in Ireland, including raised bogs, but was unable to map domestic peat extraction, because of medium spatial resolution of the data (23 m) and cloud cover issues.

Google Earth Engine (GEE), a planetary-scale cloud computing platform⁴⁰, integrates freely available high-resolution satellite imagery such as Sentinel-2, as well as machine learning algorithms such as random forest. By leveraging a vast archive of satellite imagery and employing temporal mosaicking functions within GEE, it is possible to obtain cloud-free imagery with wall-to-wall coverage and use it to map land use in areas where cloud cover impedes optical remote sensing^{41–43}. This approach was used in this study to obtain cloud-free imagery by mosaicking annual images acquired for three years i.e., from 1st January 2018 to 31st December 2020. As a result, the first national-scale land use map of raised bog with seven classes was developed. The classes were derived from the Land Use Classification of Irish Peatlands (LUCIP), which was developed for this study through discussions with various stakeholders including NPWS (National Parks and Wildlife Service), BnM, and an ecologist. The classes in LUCIP includes cutover, cutaway, grassland, forestry, remnant peatlands, water bodies, and built-up areas. The map enabled the assessment of the spatial extent of land use in raised bogs. It is further used to estimate CO₂ emissions using site-specific EFs from case studies in Ireland²⁶, which are then presented along with IPCC T1 EFs. This work will provide better insight into C dynamics at the site scale, with an emphasis on the importance of high-resolution maps for area estimation and country specific EFs.

Material and methods

Study area

The study area for this research was based on the spatial extent of raised bogs derived from the DIPMv2⁵. Raised bogs are predominantly situated in the midlands of Ireland and are a distinctive feature of this inland region. They cover ~530,000 ha of the surface area and constitute ~35% of the total peatland area in Ireland and 8% of the total land surface area. Irish raised bogs represent more than 50% of oceanic-raised bogs in the EU³⁵.

Satellite image data

Copernicus Sentinel-2-MSI (Multi-Spectral Instrument) optical remote sensing satellite images were used in this study and the images were acquired by Sentinel 2- A and B. The Sentinel-2 sensor has 13 spectral bands, 10 of which were used in this study: Red (R), Green (G), Blue (B), Near Infrared (NIR) and Narrow NIR, three of the Vegetation Red Edge, and two of the Short-Wave Infrared (SWIR)⁴⁴. Table 1 shows the spectral and spatial resolutions of the bands used in this study. The RGB and NIR bands have a spatial resolution of 10 m while the rest were resampled from 20 to 10 m. The sensor has a swath width of 290 km⁴⁴.

GEE provides the Sentinel-2-MSI Level-2A (L2A) image archive dating back to March 2017. This study used the atmospherically corrected products: L2AS2_SR (Sentinel-2 Surface Reflectance). They are corrected for atmospheric, slope and adjacency effects. L2A processing is based on a two-step process i.e., (1) scene classification (SC), which is used to derive a pixel classification map for vegetation, snow, soil, cloud shadows and cloud and (2) Sentinel-2 Atmospheric Correction (S2AC) which is used to convert the Top of Atmosphere (TOA) reflectance to BOA (Bottom of Atmosphere) values. The S2AC process is based on the library for Radiative transfer (libRadtran) model^{46,47}. It provides cloud, haze, and water removal methods. To enhance the classification process, the vegetation and water indices were calculated and included as additional bands. The Normalised Difference Vegetation Index (NDVI) with values ranging from 0.1 to 1 indicates the presence and health of vegetation⁴⁸ (Eq. 1), while the Normalised Difference Water Index (NDWI) with values ≥ 0.5 indicating the presence of open water⁴⁹ (Eq. 2).

$$NDVI = \frac{NIR - Red}{NIR + Red} \quad (1)$$

$$NDWI = \frac{NNIR - SWIR1}{NNIR + SWIR1} \quad (2)$$

Image classification methods

A remote sensing image classification-based approach was used in this study and implemented in GEE and ArcGIS Pro desktop version 2.7 (ArcPro from here onwards). The approach consisted of accessing, pre-processing, and classifying land use using LUCIP in GEE. Accuracy assessment was conducted using ArcPro. The imagery was accessed on a national scale and constrained to Irish-raised bogs using the DIPMv2. An overview of this process is shown in Fig. 1.

Image pre-processing

Despite the high temporal resolution (five days) of Sentinel-2 (A and B), obtaining a cloud-free mosaic for wall-to-wall coverage of raised bogs in Ireland was challenging. To address this, it is important to develop an efficient cloud removal methodology. Accordingly, a temporal filter was applied to obtain imagery over three years (1st January 2018 – 31st December 2020). A selection criterion to obtain images with less than 10% cloud cover was also applied; a percentage greater than this would return cloud-contaminated images that were not useful for analysis. Based on these criteria, 1483 images were available. The remaining cloudy pixels were masked out using a cloud masking function (*masksS2clouds*) which is based on the 'QA60' quality flag band used for cloud and cirrus. Finally, the images were stacked together to generate a single cloud-free composite using the median (*ee.reducer*) composite function available in GEE. This also helped eliminate pixels with extreme values, thus removing the remaining artefacts. The final image was composed of pixels with minimal or no cloud cover.

Training sample data

The training and validation data used in this study were independent of each other. The training data was based on randomly generated sample polygons created within GEE for each land use class (Table 2). Validation sample points were generated using ArcPro. A classification schema (LUCIP) was developed to identify seven land-use

Bands	Central wavelength (µm)	Spatial resolution (m)
Band 2—Blue	0.490	10
Band 3—Green	0.560	10
Band 4—Red	0.665	10
Band 5—Vegetation red edge	0.705	20
Band 6—Vegetation red edge	0.740	20
Band 7—Vegetation red edge	0.783	20
Band 8—NIR	0.842	10
Band 8a—NNIR	0.865	20
Band 11—SWIR	1.610	20
Band 12—SWIR	2.190	20

Table 1. Characteristics of sentinel-2 bands⁴⁵.

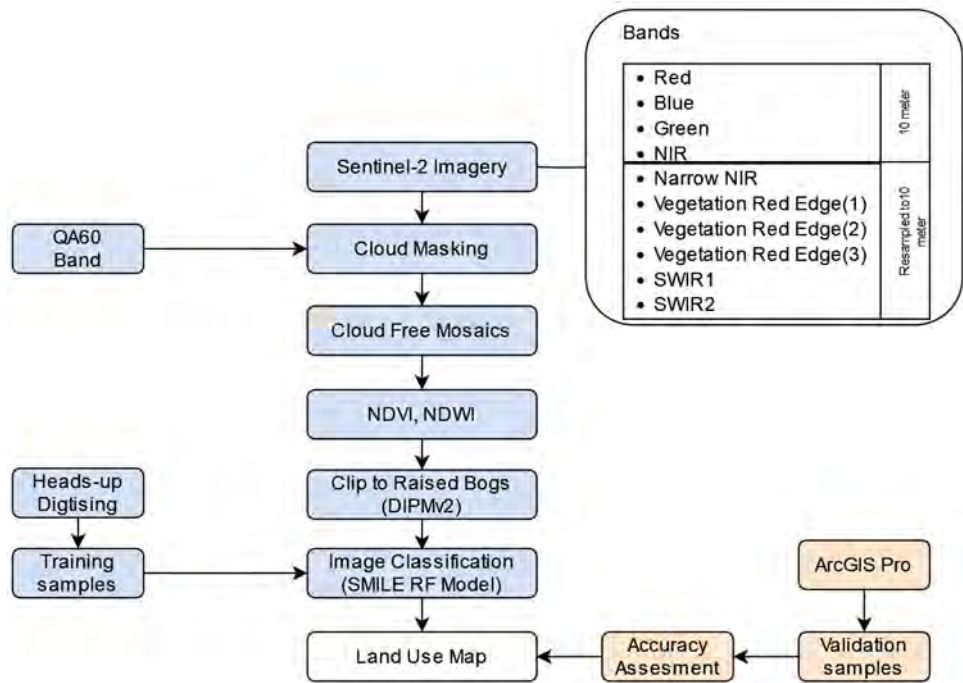


Figure 1. Data processing workflow. NIR (Near Infrared), SWIR (Shortwave Infrared), NDVI (Normalised Difference Vegetation Index), Normalised Difference Water Index (NDWI), QA60 (Quality Assessment) band for cloud and cirrus masking, and DIPMv2 (Derived Irish Peat Map version 2).

Land use class	Description
Cutaway	Land that has been subjected to industrial peat extraction, with the peat removed and/or left with a thin layer of soil, managed by BnM and other private companies with large-scale mechanised peat extraction.
Cutover	Land that has been subjected to domestic peat extraction, hand-cut, small-scale mechanised, includes bare peat, interspersed woodland, heath, and scrub.
Grassland	Agriculture grassland that is used for pasture or hay, silage, and grazing.
Forestry	Land covered with trees; afforested areas are mostly covered by evergreen tree species
Remnant Peatland	Land that has a high percentage of peat (near natural and high bog areas,) and is characterised by the presence of sphagnum mosses and other bog flora, not directly affected by human intervention. Revegetated areas of post-extraction activities.
Water bodies	Land covered with water, including natural waterways and surface water on raised bogs that have appeared after rewetting activities and/or abandonment.
Built-up/Infrastructure	Land used for human settlements and infrastructure, such as buildings, roads, windfarms etc.,

Table 2. Description of land use classes based on Land Use Classification for Irish Peatland (LUCIP) developed in this study.

classes: cutover, cutaway, grassland, forestry, remnant peatlands (high bog), and built-up/infrastructure areas (Table 2).

The collection of training data was based on the visual interpretation technique, which was used by an expert operator to generate randomly distributed sample polygons for each land use class⁵⁰. The training data consisted of 366 polygons (148405 pixels) that were randomly distributed across the study area (Table 3).

The spectral signature of each land use class is shown in Fig. 2. The mean reflectance values across multiple Sentinel-2 bands demonstrate significant spectral separability in the visible and NIR range i.e., 0.49 to 0.78 μm . Notably, built-up areas exhibit high reflectance, whereas water has low reflectance, making them significantly distinguishable. Cutaway and grassland show high reflectance in the NIR region. Cutover and remnant peatlands, however, may exhibit some similarities, given that the cutover class includes dynamic vegetation environment. The spectral separability for most classes diminishes for longer wavelength bands, specifically at 1.61 and 2.19 μm . Nevertheless, differences in spectral reflectance between all the classes remain prominently discernible, underscoring the effectiveness of the sampling procedure employed for land use classification.

Land use class	No. of training polygons	No. of training pixels (sum per training polygon)	No. of validation points
Cutaway	37	94,672	197
Cutover	45	4345	130
Grassland	32	7320	660
Forestry	100	11,627	252
Remnant Peatland	62	28,038	121
Water bodies	64	1816	50
Built-up/Infrastructure	26	587	50
Total	366	148,405	1460

Table 3. Characteristics of randomly distributed training and validation sample data.

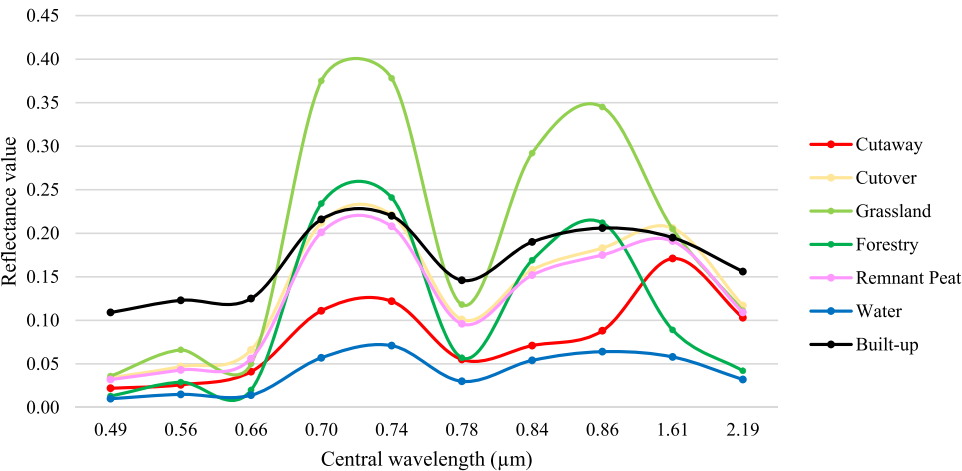


Figure 2. Spectral reflectance of the land use types across the ten spectral bands (Sentinel-2).

Classification of satellite imagery

The random forest classification model, an ensemble classifier^{51,52}, was trained using training data. The random forest algorithm is based on an ensemble of several decision trees, each with multiple nodes⁵¹. Classification was implemented using the GEE platform. A slightly improved version of the random forest model known as the Statistical Machine Intelligence and Learning Engine (SMILE) random forest algorithm was used in this study⁵³. The classification model was trained using the training data, with the number of variables and number of trees being the two critical parameters. The optimal values of these parameters were determined using the square root of the number of features and trial-and-error method. Based on these procedures, the optimal number of trees was determined as 20. Each tree in the model consists of multiple nodes, and each pixel is assigned a label by each tree. The final label for each pixel is determined by aggregating the labels assigned by all trees through a majority vote⁵¹. The random forest model and its optimisation procedures were implemented using the GEE. The variable importance for all spectral bands, NDVI, and NDWI were also assessed. Spectral reflectance bands (2, 5, 12, and 11) were ranked higher, while NDVI and NDWI were ranked lower (see Supplementary Fig. S1 online). The accuracy of the final output map was assessed using the validation data.

Validation (accuracy assessment)

After conducting a qualitative accuracy assessment (visual evaluation), the final map was downloaded from GEE and imported into ArcPro. An overall quantitative accuracy assessment was conducted using ArcPro, with independent validation point sample data (Table 3). Yelena and Antonia⁵⁴ emphasise the importance of using higher-quality reference data derived through a sampling approach to assess the accuracy of land use maps. They further noted that the data could be based on field sampling or a higher resolution spatial resolution aerial imagery. The latter approach was used in this study since the first approach could be laborious and time-consuming for national scale mapping. The “create accuracy assessment tool” in ArcPro was used with a stratified random sampling strategy⁵⁵. The tool generates random points, and the sample size is based on the proportion of the area for each class. This process ensures that a sufficient number of reference samples is created for each stratum (class)⁵⁵. A total of 1460 points were obtained (Table 3). Each validation sample data point was assessed and manually labelled through the visual interpretation of very high-resolution aerial imagery (25 cm) by a single expert operator. After completion of manual labelling, a confusion matrix for accuracy assessment was generated using the “compute confusion matrix” tool in ArcPro. This was performed by comparing the classes

obtained using the classification model with the ground truth data. Multiple statistics were derived from the confusion matrix to quantify the map accuracy. These include the Overall Accuracy (OA), overall agreement between classification (map), and ground truth for all classes. The User's accuracy (UA) measures the agreement between the classified pixels and the ground-truth data for a specific class from the user's perspective, whereas the Producer's accuracy (PA) measures the agreement between the classified pixels and the ground-truth data for a specific class from the producer's perspective⁵⁶. Lastly, owing to the presence of errors in the classification results, a simple pixel counting method to calculate the land use area is not adequate. Therefore, 'good practices', as suggested by Olofsson et al.⁵⁵ were used to generate an area-based error matrix and calculate the unbiased land-use area for each class.

CO₂ emission calculations

CO₂ emissions were calculated using the IPCC T1 EFs and literature-based T2 EFs using Eq. (3). Four dominant land use classes (cutaway, cutover, forestry, and grassland), which cover ~85% of the total raised bog land use area (Fig. 3) were used for emission estimation. For the remaining classes (remnant peatlands, water bodies, and built-up areas), neither T1 nor T2 emission factors were available; therefore, CO₂ emissions could not be estimated. T1 default EFs from the IPCC Wetland Supplement (2013) and T2 EFs by Aitova et al.²⁶ which are based on case studies in Ireland for grasslands, cutover and cutaway sites were used. The EF for forestry is based on eight drained and afforested peatland sites in Ireland⁵⁷.

$$\text{CO}_2 \text{ emission (tCO}_2\text{ - C ha}^{-1}\text{y}^{-1}) = \text{land use area (ha)} \times \text{EF (tCO}_2\text{ - C ha}^{-1}\text{y}^{-1}) \quad (3)$$

where t is tons, ha is hectares, y represents a year, and EF is the land use specific emission factor.

Results

The statistics for the area of each land use class in raised bogs obtained using the error matrix (see Supplementary Table S1 online) are presented in Fig. 3. Almost half of the raised bogs mapped in this study are covered by grassland i.e., 43% (244,100 ha). Forest covers about 21% (116,427 ha), cutaway 10% (54,302 ha) and cutover cover 11% (646,99 ha). Remnant peatlands (high bog) area covers about 13% (73,795) ha. Water bodies and built-up areas account for about 1% (1542 ha and 1358 ha, respectively). The water bodies here constitute both natural waterways included in the coarse resolution DIPMv2 and surface water on raised bog appearing possibly after rewetting activities.

The prevalence of land use activities can be seen across all raised bogs in the midlands of Ireland Fig. 4. Industrial peatland extraction sites are primarily located in the midlands (Fig. 4a) and some parts of the north (Fig. 4b and c) and south (Fig. 4f) of the midlands. Approximately 65% of these industrial extraction sites are owned by BnM. The other 35% constitute non-BnM peat extraction carried out on an industrial scale similar to BnM (Fig. 4d and e). BnM landholding and Special Area of Conservation (SAC) boundary data were used to further examine the distribution of land use to better understand the status and condition of raised bogs under different management regimes, i.e., industrial and protected (Table 4). Additionally, Coillte landholding boundary data was also used to assess land use. It owns ~31,000 ha of raised bog areas accounting for about one-third of the total forestry on these bogs.

The exposed peat on BnM landholdings amounts to around 42,264 ha. The rest of the cutaway bogs, totalling about 2,460 ha, are in SAC, highlighting the existence of a substantial amount of bare peat on these "protected" bogs with active cutting also taking place⁵⁸. Cutaway bogs in midlands have interspersed forestry (Fig. 4a). The areas on the edges of these bogs represent agricultural grasslands. The remnant peatlands in the midlands and are mostly on SAC sites such as Clara Bog, Ferbane Bog, Moyclare Bog, Moyclare Bog, and Raheenmore Bog (Fig. 4a). Overall, there is about 13,053 ha of the remnant peatlands located on the SAC, which is approximately 1% of the total peatland area and most of the "actively forming raised bogs" are possibly located in these sites⁵⁹. The majority of the remnant peatlands are in the west of the midlands and are surrounded by peat-extraction activities (Fig. 4d and e). Lastly, the scattered water bodies on cutaway sites in the Midlands and some parts in the North are possible signs of some of the rewetting activities being carried out by BnM (Fig. 4a and b).

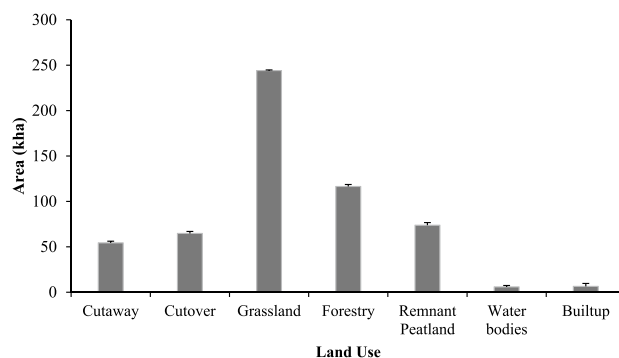


Figure 3. Land use area in kilo hectares (kha) for each class, error bars for standard errors in kha.

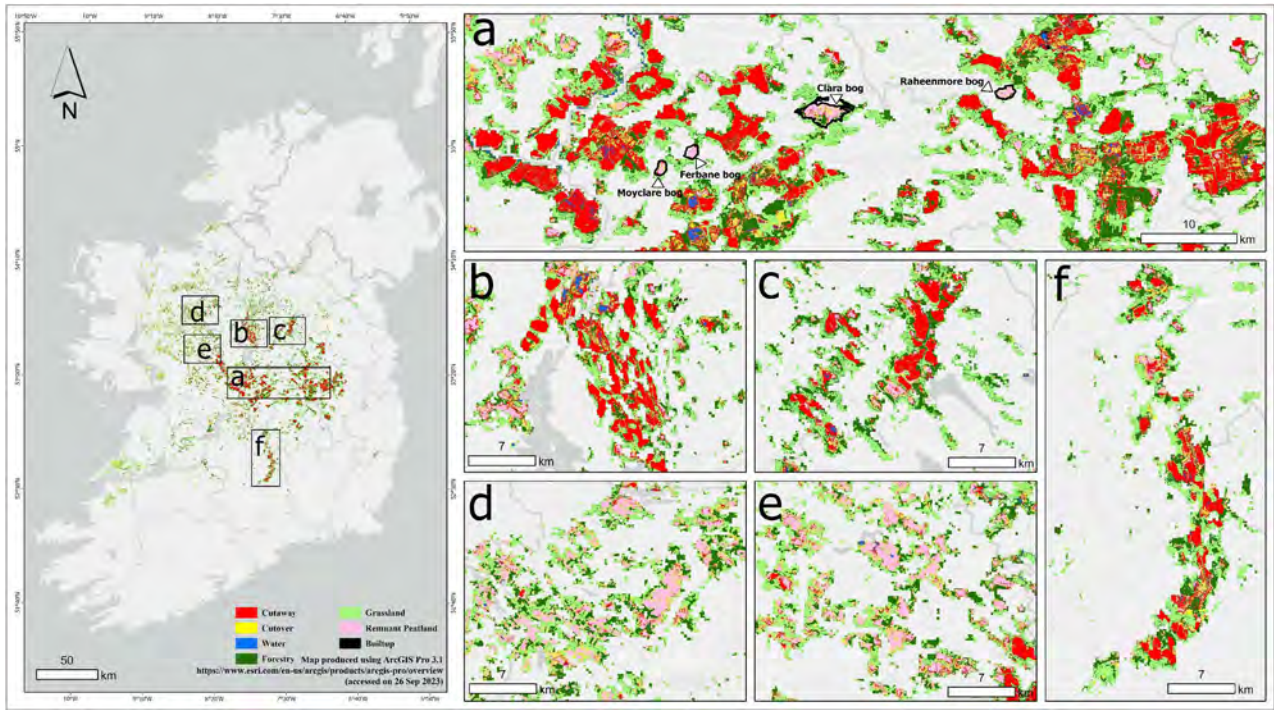


Figure 4. Land use on raised bogs. (a), (b), (c) and (f) are dominated by industrial peat extraction sites (mostly Bord na Móna), whereas (d) and (e) have a mix of remnant peatland, cutover, grassland, and forest.

Class	BnM (ha)	SAC (ha)
Cutaway	42,264	2460
Cutover	7303	4907
Grassland	2379	7318
Forestry	9067	3490
Remnant Peatland	6491	13,053
Water bodies	1580	1340
Built-up/Infrastructure	388	197
Total	69,472	32,568

Table 4. Proportion of each land use on Bord Na Móna (BnM) and Special Area of Conservation (SAC) under the national parks and wildlife services (NPWS). All areas are in hectares (ha).

CO₂ emissions

CO₂ emissions presented in Table 5 are calculated using Eq. (1) for the four land use classes. The area (ha) is estimated from the land use map (Fig. 4). T1 emissions were ranging between 303,710 and 1,293,730 t CO₂-C ha⁻¹ y⁻¹ with grassland being the highest emitters followed by forestry, cutover, and cutaway. T2 emissions were in the range of 65,705–317,330 t CO₂-C ha⁻¹ y⁻¹, with the highest emissions in grassland and the lowest emissions in cutaway. The T1 emissions for grassland were four-fold higher than T2 emissions. The total CO₂ emissions

Land Use	Area (ha)	T1 (IPCC) EFs	T1 Emissions (t CO ₂ -C ha ⁻¹ y ⁻¹)	T2 (literature) EFs	T2 Emissions (t CO ₂ -C ha ⁻¹ y ⁻¹)	No. of sites for T2 EFs	References
Cutover	64,699	2.8 (1.1–4.2)	181,157	1.21 (0.4 – 2.0)	102,871	3	26
Cutaway	54,302	2.8 (1.1–4.2)	152,046	1.59 (1.2 – 2.0)	65,705	4	26
Forestry	116,427	2.6 (2.0–3.3)	302,710	1.68 (1.04 – 2.32)	195,597	8	57
Grassland	244,100	5.3 (3.7–6.9)	1,293,730	1.3 (0.04 – 2.55)	317,330	3	26

Table 5. Emissions from four dominant land use classes, with Intergovernmental Panel on Climate Change (IPCC) Tier 1 and 2 (T1 and T2) Emission Factors (EFs) with 95% confidence intervals values are shown in brackets, Emissions based on the area in hectares (ha) and EFs (in tonnes of CO₂-C per hectare per year).

from Irish-raised bogs based on the four land use classes mapped here account for 0.68 Mt CO₂-C ha⁻¹ y⁻¹ as per T2 and 1.92 Mt CO₂-C y⁻¹ as per T1.

Accuracy assessment

The OA of the final land use map was 89% which is computed from the diagonal line of the confusion matrix (Table 6), representing the number of correctly classified classes. A total of 1303 of 1460 points were correctly classified. The UA ranges from 70% (water and cutover) to 96% (forest), and PA ranges from 64% (built-up) to 97% (cutaway).

The results show the highest PA for cutaway (97%) and grassland classes (93%) while remnant peatlands (75%) and built-up (64%) have the lowest PA. Forestry (97%), grassland (94%) and remnant peatlands (91%) all show high UA, while built-up (68%), cutover and water (70%) show low UA. The lower UA of the cutover class (70%) can be attributed to the presence of heterogeneous vegetation, resulting in a mosaic landscape following the abandonment of extraction sites. As a result, this class is prone to misclassification, particularly with remnant peatlands (another landscape characterised by heterogeneity) (Fig. 2). The lower UA of water bodies (70%) and misclassification with forestry can be attributed to overlap in spectral signatures in partially vegetated and surface water areas, as shown in Fig. 4.

Discussion

The degradation of Irish-raised bogs due to centuries of human exploitation is widely acknowledged^{6,12,13}. Nevertheless, a significant knowledge gap exists in the absence of “robust aerial data” for accurate assessment of land use on the raised bog^{14,26}. This gap in spatial data is addressed through the development of the LUCIP taxonomy and its implementation in GEE using Sentinel-2 data. This study provides the first high-resolution wall-to-wall coverage of land use on raised bogs in Ireland. The robust methodology presented here facilitates an accurate assessment of the magnitude and extent of land use and CO₂ emissions on these ecosystems. It utilises cloud computing (GEE), temporal mosaicking, and machine learning (random forest and high-resolution remote sensing imagery (Sentinel-2)) to overcome the issue of persistent cloud cover in Ireland. The accuracy assessment results (overall accuracy of 89%) showed good agreement between the map and the reference data.

Currently, the Irish National Inventory Report (NIR) only considers peat extraction activities (industrial/domestic) in the “managed wetlands” category for all peatlands (blanket and raised bogs). This area is reported as 70,020 ha, of which 400 ha is domestic cutover with the remainder being industrial cutaway, and emissions calculations in the NIR are also reliant on these area estimates³². In literature, this figure is ~80,000 ha, which is mainly the BnM landholding^{12,14,32,60}. However, the findings of our study which focused only on raised bogs, indicate that peat extraction (cutaways and cutovers) is considerably more prevalent than currently reported and extends to approximately 119,000 ha. This is 70% higher than the NIR-reported “managed wetland” area figures for all peatlands. Hence, we address the overall ambiguity in existing land use estimates by providing accurate spatially explicit land use information derived from robust remote sensing methods.

The results depict heterogeneous land use in raised bogs across Ireland. The midland raised bogs (Fig. 4a, b, c, and f) are dominated by industrial mining activities as well as conversion to grassland and forestry. The more peripheral raised bog areas to the west, northwest, and southwest of the midlands are dominated by conversion to grassland and forestry. In general, the most extensive land use on raised bogs is agricultural grassland which is distributed across the region. Grasslands mainly occur on the margins of cutaway, cutover and remnant peatlands. The remnant peatland class, which represents the remaining areas of the raised bogs, are not in pristine condition, and are more abundant towards the North and West of the midlands, away from the areas of intensive industrial peat extraction activities. The BnM Peatland Climate Action Scheme (PCAS) aims to restore degraded peatlands within BnM landholding and is a good start for mitigation and adaptation, which are more intact raised bogs in the north and west that could be targeted for active restoration by policymakers, facilitating carbon retention in these ecosystems. It is also pertinent to mention that the PCAS was initiated at some of the former industrial peat extraction sites during the timeframe of this study. Most of these areas are still bare peat which means the data produced in this study could be used as baseline data for tracking and monitoring the PCAS over time.

Class	A	B	C	D	E	F	G	Total	UA (%)
Cutaway (A)	164	12	1	8	2	10	0	197	83
Cutover (B)	0	91	0	4	15	19	1	130	70
Water (C)	1	0	35	8	2	0	4	50	70
Forest (D)	1	2	0	244	4	1	0	252	96
Grassland (E)	2	1	1	12	624	6	14	660	94
Remnant Peatland/High Bog (F)	1	2	0	2	5	111	0	121	91
Built-up (G)	0	0	0	3	13	0	34	50	68
Total	169	108	37	281	665	147	53	1303	OA (%)
PA (%)	97	84	94	86	93	75	64		89.2

Table 6. Result of accuracy assessment for the seven land use classes, including Overall Accuracy (OA), User’s Accuracy (UA), and Producer’s Accuracy (PA). The emboldened diagonal elements represent accurately classified areas.

Overall, the maps show that the current level of human-induced degradation of these raised bogs through land-use change requires immediate action for sustainable management of these ecosystems.

On BnM landholdings, industrial extraction activities have gradually ceased over the past two decades, with an announcement of complete cessation in 2021. The results of this are beginning to be observed in the data. At the Blackwater site (Co. Offaly) site (Fig. 5), areas are classified as remnant peatlands, which is an indication of revegetation after the cessation of extraction activities (pre-2000) and subsequent rewetting in 1999⁶¹. These sites are going through a transformation with land use conversion to forestry or a diverse mosaic of vegetation communities composed of heather, shrubs, grasses, and interspersed larger plants. The forestry areas in Fig. 5, are on Coillte landholdings and are highlighted with a grey outline. Other areas with surface water are possibly signs of rewetting activities and are represented by surface water here (Fig. 5). Vegetation cover at Blackwater has increased over the years, albeit slowly, with *Sphagnum* mosses and other bog species recolonising the area i.e., sparse remnant peatlands patches among the prevalent bare peat (cutaway) (Fig. 5). This recovery process is not only important for carbon sequestration and climate change mitigation but also for the restoration of the unique biodiversity and ecosystem services provided by peatlands. An SAC site is outlined (white dotted line) in the bottom right (Fig. 5) and shows a good example of what is considered a “near natural” raised bog e.g., intact centre but degraded margins where substantial cutting has taken place and areas converted to grassland. These changes can be seen using Sentinel-2 which demonstrates the utility of this methodology for tracking and monitoring land use change in raised bogs over time.

The EU has established a range of regulations and initiatives that directly or indirectly require restoration and sustainable management of peatlands. These include the Habitats Directive (Council Directive 92/43/EEC), Water Framework Directive (Directive 2000/60/EC), EU Biodiversity Strategy for 2030, Common Agricultural Policy (CAP), Natura 2000 Network (Directive 2009/147/EC), LIFE Programme, EU Climate Adaptation Strategy, and more recently the Nature Restoration Law which includes restoration of peatlands by binding targets and net zero CO₂ emissions from these ecosystems by 2050. The effective implementation of these initiatives is only possible through robust mapping, tracking, and monitoring⁶² methodologies such as those proposed in this study.

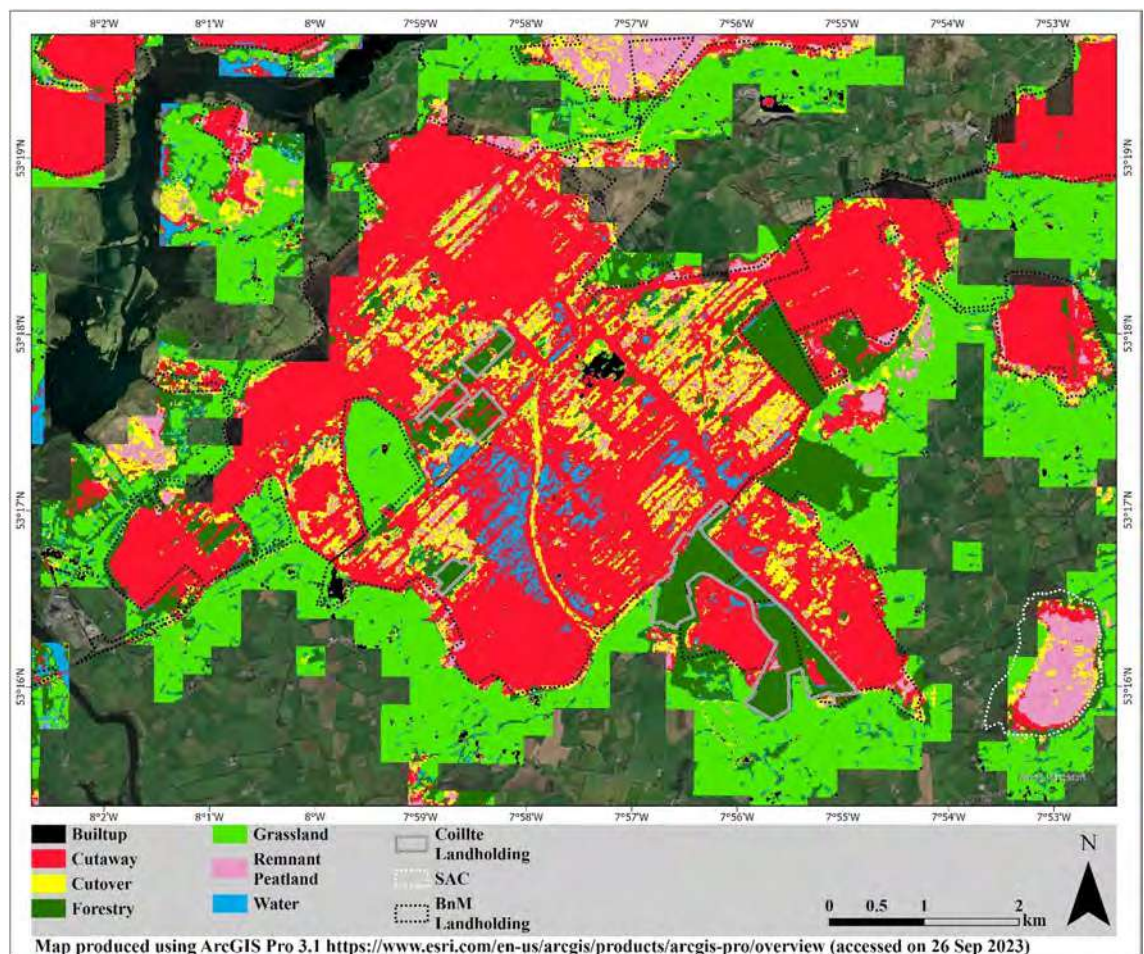


Figure 5. Typical example of a former industrial bog complex mapped in this study. The areas outlined by the black dotted lines are within the BnM (Bord na Móna) landholdings, whereas the white dotted lines in the southeast section of the map show a bog under SAC (Moyclare Bog). The grey boundaries in the BnM landholdings and outside of it are Coillte landholdings.

The map produced here serve as an important indicator for determining the baseline status and condition of these ecosystems as well as providing a quantification of CO₂ emissions hotspots. By providing a detailed map of BnM/non-BnM industrial activities and domestic extraction activities, this study not only highlights these activities in a spatial context but also estimates emissions from them. The emissions calculated in this study based on IPCC T1 and Ireland-specific T2 EF show a substantial difference. The IPCC default emission factor is higher than the Irish T2 EF resulting in higher emission estimation. One of the limitations of using IPCC T1 EFs is that these EF are based on limited case studies with diverse geographical locations, climatic conditions and ecology not necessarily suited to Irish Peatlands. The EFs proposed by Aitova et al.²⁶ and the EFs from the study by Jovani-Sancho³⁷ are based on measurements from specific sites in Ireland, the United Kingdom and Germany, and may not be a true representatives of other sites in the country. For example, T1 EFs for grasslands (5.3 t CO₂-C ha⁻¹ y⁻¹) are mostly based on study sites from Germany, which are under more intensive management practices compared to Ireland^{26,63}. This may lead to a substantial difference when comparing T2 EFs for grasslands in Ireland (1.30 t CO₂-C ha⁻¹ y⁻¹)²⁶. While these EFs could be refined specifically for Ireland, their use by Aitova et al.²⁶ is a significant improvement compared to the T1 EFs. Finally, the delineation of raised bogs in this study relies on an existing peatland extent map i.e., DIPMv2. Although, DIPMv2 is most current peatland map in Ireland, with an overall accuracy of 88%, it tends to underestimate the presence of peatlands with areas smaller than 7 ha⁵. This study can be expanded to these missing areas if the DIPMv2 is updated in the future.

Nevertheless, this study demonstrates the robustness and utility of remote sensing methods to accurately map the land use on peatlands and to integrate these data with the latest T2 EFs thus refining estimates of CO₂ emissions from different land use on Irish peatlands. The LUCIP implemented in GEE facilitates the development of highly accurate land use maps that can aid the refinement of national-scale T2 reporting in these globally rare ecosystems. These integrated spatial datasets can help inform decision-making for sustainable land management practices and conservation. Furthermore, detailed habitat mapping of the remnant peatland class using a high-resolution dataset and integrated Sentinel-1 and 2 approach could be useful for monitoring active raised bog areas in SAC^{42,64}. Future work using the LUCIP could address the large knowledge gap regarding land use type and extent on blanket bogs, which account for ~70% of peatlands in Ireland and have not been studied at this level in Ireland. It is important that the EFs and emissions are assessed for these areas to identify C and GHG emission hotspots and areas for targeted restoration.

Conclusion

In this study, a spatially explicit dataset of land use on Irish raised bogs was created by integrating the DIPMv2 and Sentinel-2 satellite images collected between 2018 and 2020. Overall, the accurate results (OA = 89%) of this study provide valuable insights into the spatial extent of land use in raised bogs in Ireland. These data were integrated with T2 EFs to refine the estimation of CO₂ emissions from the four major land classes on raised bogs. These spatial data on land use can inform policies on land use and emissions at a national scale. The map also enhances the current understanding of the extent and scale of different land uses (especially peat-extraction activities) in a spatial context. The state and condition of raised bogs in Ireland present a pressing concern due to their substantial CO₂ emissions. Urgent measures are required to address this issue, including (i). mitigating emissions and (ii). implementing sustainable management practices to promote carbon sequestration within these ecosystems and prevent additional degradation. This spatial information can be used to inform the development of more sustainable approaches to peatland management in the country, the decision-making process for developing such policies and effective strategies to mitigate these management impacts.

Data availability

The datasets used and/or analysed during the current study are available from the corresponding author upon reasonable request.

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Author contributions

W.H. lead the preparation, creation and/or presentation of the published work, specifically writing the initial draft. He took a lead role in the development and design of the methodology using Remote Sensing and GIS analysis in both GEE and ArcPro as well as in data curation. Both W.H. and J.C. conceptualised the study. R.I. contributed to the emission calculations. Both M.S. and J.C. contributed to the review and editing of the manuscript.

Competing interests

The authors declare no competing interests.

Additional information

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OBSERVATION ON BEHALF OF BIRR WIND ACTION GROUP TO AN COIMISIUN
PLEANALA REGARDING 10 YEAR PLANNING PERMISSION FOR THE PROPOSED
DEVELOPMENT OF BALLINCOR WIND FARM AND ALL ASSOCIATED
INFRASTRUCTURE PERTAINING TO POTENTIAL IMPACTS ON AVIFAUNA

JUNE 2026



1 Competency of Author

This report, prepared by Dr Patrick Moran on behalf of the Birr Wind Action Group concerns a 10 year planning permission to An Coimisiún Pleanála by RWE Renewables Ireland Ltd. for the proposed development of Ballincor Wind Farm and all associated infrastructure located within the townlands of Cloonaheen, Ballincor Demesne, and Curralanty, County Offaly, and Clonfree, Castletown and Cronekill, County Tipperary. This report comprises a peer-review of ecological aspects of the proposed development, in particular with regard to the potential impact on avifauna and the potential identification of likely significant effects on the conservation objectives of proximate SPAs. Dr Moran holds a 1st class honours degree in Environmental Biology (UCD), a Ph.D. in Ecology (UCD), a Diploma in EIA and SEA management (UCD), a M.Sc. in Geographical Information Systems (UU, Coleraine), a Higher Diploma in Environmental and Planning Law (King's Inn) and a M.Sc. in Environmental and Climate Change Law (UCD). Dr Moran has in excess of 25 years of experience in undertaking ecological surveys on both an academic and a professional basis. Dr Moran has peer-reviewed EIAR and NIS for a multitude of both public (for example An Bord Pleanála, Office of Public Works and Co. Councils) and private clients regarding a wide variety of planning proposals.

2 Brief Outline of proposed development

The proposed project will consist of the development of 11 no. wind turbines and all associated infrastructure including turbine foundations, hardstanding areas, borrow pits, access tracks. The proposed project also includes the proposed grid connection route (GCR), which extends approximately 12.23 km from the northern edge of the wind farm site to the existing Dallow 110kV substation in the townland of Clondallow, Co. Offaly, and works along the road network for the proposed turbine delivery route (TDR).

While it is recognised that renewable energy projects are vital for the achievement of climate goals, the appropriate siting of such projects and the provision of sufficient data to inform the potential environmental impacts of renewable energy projects is nevertheless required. While this report is limited to a review of the information presented with regard to the avifaunal resource occurring, this development is proposed in a very sensitive ecological location and all ecological aspects of the information submitted should be subject to scrutiny.

3 Grounds for objection

Given the current Climate and Biodiversity Emergency, and the inextricable link between the two issues, this objection recognises the necessity for renewable energy. Wind energy production is a key component of combatting climate change. Biodiversity and climate change commitments have equal standing. The realisation of both Biodiversity and Climate Change commitments, without compromising each other, is crucial. Indeed, enhancing biodiversity is key to ameliorating the impacts of climate change.

This objection concerns inadequacies (primarily pertaining to avifauna) within the relevant chapters of the Environmental Impact Assessment Report (EIAR)/related documents and the impacts of these inadequacies on the findings of the Natura Impact Statement (NIS). These inadequacies have potentially precluded the implementation of mitigation measures pertaining to elements of the local avifaunal resource and in particular, on the Qualifying Interests of proximate Special Protection Areas. Please note that the identification of inadequacies herein are limited by time and resources. Some of the primary concerns regarding the proposed development are outlined in the following sections

DRAFT FOR COMMENT

3.1 Inadequacy of Environmental Impact Assessment Report (EIAR)

An Environmental Impact Assessment Report (EIAR) has been prepared regarding the proposed development. It is submitted that the EIAR does not comply with the requirements of Article 3 (1) (b) of the EIA Directive¹ under which an environmental impact assessment is required to identify, describe and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on biodiversity with particular attention to species and habitats protected under (*inter alia*) the Habitats Directive².

A representative sample of the inadequacies of the EIAR and associated reports with regard to potential impacts on avifauna are presented herein. Considering the importance of the potential impacts of a development of this type on avifauna, this does not generate confidence in the adequacy of other aspects of the EIAR presented.

3.1.1 Ornithology survey methodology

The level of detail of the methodology utilised to undertake bird surveys is wholly insufficient to inform the assessment of potential likely significant impacts and/or effects. Examples of these insufficiencies are presented below.

3.1.1.1 Insufficient data regarding surveys undertaken

There is a complete absence (both within the Ornithology Chapter and Appendix 7.1 Ornithological Results) of a summary table detailing the requisite information for each survey as per Annex 3 of the Nature Scot Guidelines. There are no details presented with regard to each Vantage Point survey as to the observer, the start time, the finish time or the prevailing weather conditions. Although dates and times are presented for individual observations within Appendix 7.1 (Ornithological Results) there is no data presented to indicate the period over which Vantage Point surveys were undertaken. There are a number of issues arising concerning this lack of information.

¹ Directive No. 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment as amended by Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014

² Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora

In the Collision Risk Modelling presented (REPORT NUMBER: 2604-F1) with the proposed development it is indicated within Section 1.5 (Limitations) that

“...The methodology of most of the vantage point surveys carried out for this project deviated in a number of respects from the recommended methodology...”

While the Collision Risk Model indicates that owing to deviations, conservative assumptions have been applied, the Collision Risk Model does not fully elucidate exactly how the methodology for the vantage point surveys has deviated, or the degree to which this deviation might impact the outcome of the model. For example, it is specifically stated within The Nature Scot Guidelines that

*“...VP survey **must** not take place simultaneously with any other fieldwork on the site, as it may cause disturbance and **invalidate** the VP survey results....”*

In addition to a lack of a table outlining the dates, start/finish time weather and observer data for bird surveys – there is, for the most part, also a lack of this data presented for any of the other ecological surveys (habitat, general mammal, etc.). In fact, details regarding the times, dates and surveyors is almost universally absent. The methodology describing Aquatic Ecology Surveys (6.2.6.5 of the Biodiversity Chapter of the EIAR, 6), however, indicates

*“...Aquatic surveys were conducted between the 2nd and 3rd of August 2022 and 26th and 30th of June 2023. Electrofishing surveys were carried out by TOBIN ecologists between the 8th and 10th of July 2024. Aquatic surveys consisted of an evaluation of the aquatic habitats, fisheries assessment (fisheries habitat appraisal, salmonid nursery and spawning habitat), biological river quality (aquatic macroinvertebrate species composition) as per McGarrigle et al., (2002), electrofishing and the presence/absence of protected aquatic species including that of White- 2 Maps - Biodiversity Maps (biodiversityireland.ie) clawed crayfish (*Austropotamobius pallipes*), Atlantic Salmon (*Salmo salar*), Lamprey species, Freshwater pearl mussel (*Margaritifera margaritifera*) (FWPM) and the suitability of habitat for European eel (*Anguilla anguilla*)...”*

While the absence of a detailed schedule of surveys precludes a direct comparison in order to determine if there was a systematic undertaking of surveys simultaneously with vantage point surveys (in direct contravention of the Nature Scot Guidelines), on the 27th of June 2023 there were a minimum of three vantage point surveys undertaken at the same time as aquatic surveys were being conducted. In the absence of detailed dates and times for all ecological surveys, it is not possible to illustrate the degree with which vantage point surveys deviated from the guidance that **VP survey must not take place simultaneously with any other fieldwork on the site**. It is acknowledged in the Nature Scot

Guidelines that undertaking other surveys simultaneously may invalidate the Vantage Point surveys and as such, any Collision Risk Modelling based on such Vantage Point Surveys.

It is specifically stated within the Nature Scot Guidance that

“...Wintering water birds (waders, waterfowl and gulls) may show regular flight routes to and from nocturnal roosts, as well as movements associated with tidal cycles, and these must be factored into survey design if they are likely to use or pass through the survey area...”

The complete absence of details of the Vantage Point surveys to include start/finish times of each survey precludes a detailed analysis of the survey effort undertaken with regard to movements to/from nocturnal roosts/foraging grounds (of particular importance with regard to species such as Whooper Swan, Golden Plover and Lapwing, all of which commute at times of limited light). The vast majority of ornithological surveys were undertaken by Ecology Ireland (2022 – 2024 inclusive). The Collision Risk Model, prepared for the proposed development indicates that

“...The Ecology Ireland vantage point surveys were concentrated in the middle of the day, but there was some coverage of the early morning period during the winter months (see Section 2.5.5). The TOBIN surveys included full coverage from sunrise to sunset, and also covered the hours before sunrise and after sunset as recommended for waterfowl by the NatureScot guidance...”

The Collision Risk Modelling identifies, therefore, that the majority of ornithological surveys undertaken were not as per the recommendation by the Nature Scot Guidance.

Critical to the calculations utilised in the Collision Risk Modelling Report presented is the use of “Vantage Points” and generation of viewsheds from these vantage points. While viewsheds were generated utilising a scientific assessment within the Collision Risk Model as presented by Dr Gittings, there is no indication that viewshed analysis of the subject site was undertaken prior to surveys in order to inform the location of Vantage Points for the purpose of Vantage Point Surveys.

At no point in the documentation presented within the Biodiversity Chapter of the EIAR, the Ornithology Chapter of the EIAR or Appendix 7.1 (Ornithological Results) to the EIAR is there any details of the co-ordinates utilised for Vantage Point surveys. Within the Nature Scot Guidance it is stated that

“...Changing the VP location complicates collision risk analysis and assumptions cannot be made that viewshed (the view visible from the VP location) areas will be the same. It is therefore critical that the spatial coordinates of VP positions are measured to the highest level of accuracy using a GPS. The VP locations and associated viewsheds referred to in the environmental statement must be those used in the field...”

Within the Collision Risk Model it is acknowledged that

“...Vantage point (VP) locations and initial viewshed arcs were provided by Ecology Ireland and TOBIN. Because the Ecology Ireland arcs did not align precisely with the VP coordinates, I generated revised arcs using the azimuths of the supplied arc boundaries, ensuring geometric alignment with the VP locations. A 10 m buffer was applied during raster processing to avoid edge artefacts; final outputs were clipped to the unbuffered arcs...”

There is no indication that the Vantage Point surveys undertaken by Ecology Ireland were based on a viewshed analysis generated through a scientific process such as the use of a Geographic Information System. There are several variables upon which the outcome of viewshed analysis is dependant, but the input surface raster (for example Digital Elevation Model, DEM or Digital Terrain Model, DTM), Input point (vantage point) and height of observer are key components. Viewshed analysis must be undertaken based on the consistent use of a vantage point and from the observer height of the shortest surveyor involved in surveys. As opposed to viewshed analysis informing the optimal placement of vantage points. The viewsheds as utilised for the Collision Risk Modelling appear to have been “reverse-engineered”. Nature Scot Guidance indicates that

“...potential detectability issues should be borne in mind when selecting VP locations to ensure they are as appropriate as possible for the species to be surveyed...”

The importance of the choice of Vantage Points from which to undertake Vantage Point surveys is highlighted in the Nature Scot Guidance. The primary aim of the Vantage Point surveys should be to maximise coverage of the survey area while using the minimum number of Vantage Points in order to minimise disturbance of the flightlines of target species. It is stated in the Nature Scot Guidance that

“...It is very important that VPs are chosen to achieve maximum visibility with the minimum number of points. As detection of flight activity will decrease with distance, VPs should be located as close to the survey area as possible...”

The lack of viewshed analysis in informing Vantage Point placement is indicated by the finding within the Collision Risk Model that

“...The Ecology Ireland viewsheds had large overlaps. EI1 and EI2 shared much of the closest sections of their viewsheds, where detection rates would have been highest, while there were large overlaps between EI3 and EI5, EI4 and EI7, and EI6 and EI7. Vantage point watches were frequently carried out concurrently at these overlapping viewsheds, resulting in duplicated spatial coverage and a high risk that the same flightlines were recorded at more than one vantage point. Conversely, periods of low activity would also have been spatially duplicated...”

Furthermore, in Section 3.1.2.1 of the Collision Risk Model, it is stated that with regard to Ecology Ireland survey effort

“...The mapped flightlines included many that were outside the viewshed arcs, and, at some vantage points, there was a more or less 360° distribution of flightlines around the vantage points...”

Nature Scot Guidance indicates, however, that

“...We recommend scanning an arc of up to 180° from each VP. Larger arcs cannot be scanned efficiently...”

3.1.2 Sample of inadequacies of data provided with regard to specific species

With regard to timing of survey visits, it is stated in the Nature Scot Guidelines that

“...All bird species have varied seasonal and within day activity patterns. Survey design should be based around the times when birds are likely to be most active. It is important that survey methods are followed accurately...”

Examples of species to which survey design has not taken into account behavioural ecology are presented in the following sections. The desk-top study identified the likely presence of these species within the survey area and the survey design should have taken these species into account.

3.1.2.1 Golden Plover

According to Section 7.4.2.1.9 of the Ornithology chapter of the EIAR

“...Golden Plover was regularly recorded within the study area during the baseline surveys. Over the survey period, a total of 125 observations were made, involving 20,226 individual birds. With the proposed project site flock sizes ranged from four to 700 individuals, with the largest counts occurring in flooded fields to the north of the site near the Little Brosna River. The species was also recorded in other wetland habitats throughout the wider study area, with the largest flocks of up to 4,000 individuals sighted at the River Little Brosna Callows SPA. The majority of records occurred during the winter season or in the late breeding season (September), which is consistent with the species’ known wintering and migratory behaviour in Ireland. There was no breeding activity recorded over the survey period. Golden Plover was primarily observed foraging, resting, or flying between feeding areas within and around the site. The site is considered to provide valuable wintering habitat for Golden Plover. Given the high frequency of records, large flock sizes, and the species’ Red listed status, the local population using the site is assessed to be of local importance (higher value)...”

Despite the recognition within the assessment that the site is considered to provide valuable wintering habitat for Golden Plover, there was no multi-year, over-winter systematic post-sunset bird surveying undertaken for this Annex I bird species. Significant populations (in light of the National large decline in this species³) of Golden Plover were identified as utilising the habitats in the *environs* of the proposed development. Golden Plover typically forage across farmland at night and the day-time distribution of these species cannot be used to predict post-sunset use of habitats⁴. The Nature Scot Guidelines state

“...For species which are active at dawn and dusk, or at night, other methods of recording or assessing activity need to be employed. Night vision/infra-red equipment and survey on moonlit nights can establish presence of nocturnal species or presence and direction of feeding/migration movements both by calls and by sight...”

Golden Plover is an Annex I (Birds Directive⁵) species and is a Qualifying Interest of several SPAs proximate to the proposed development. Indeed, the Natura 2000 data form for River Little Brosna Callows SPA (IE0004086) (identified as being within the zone of influence of the development)

³ https://birdwatchireland.ie/app/uploads/2023/08/iwebs_trends_00000_National.html

⁴ Gillings S, Fullar R and Sutherland W (2005). Diurnal studies do not predict nocturnal habitat choice and site selection of European Golden Plover (*Pluvialis apricaria*) and Northern Lapwing (*Vanellus vanellus*). *The Auk*, **122**(4), pp 1249 – 1260.

⁵ Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds

indicates that the population Golden Plover occurring at this site is of excellent value (A) both in terms of Conservation and Global importance. The failure to adequately assess the post-sunset use of the habitats occurring at/near the development site by a Qualifying Interest of proximate SPAs is a critical flaw in the assessment of the ecological resource occurring, with serious ramifications for the conclusions of the EIAR, the Collision Risk Modelling and the NIS prepared in support of the proposed development⁶.

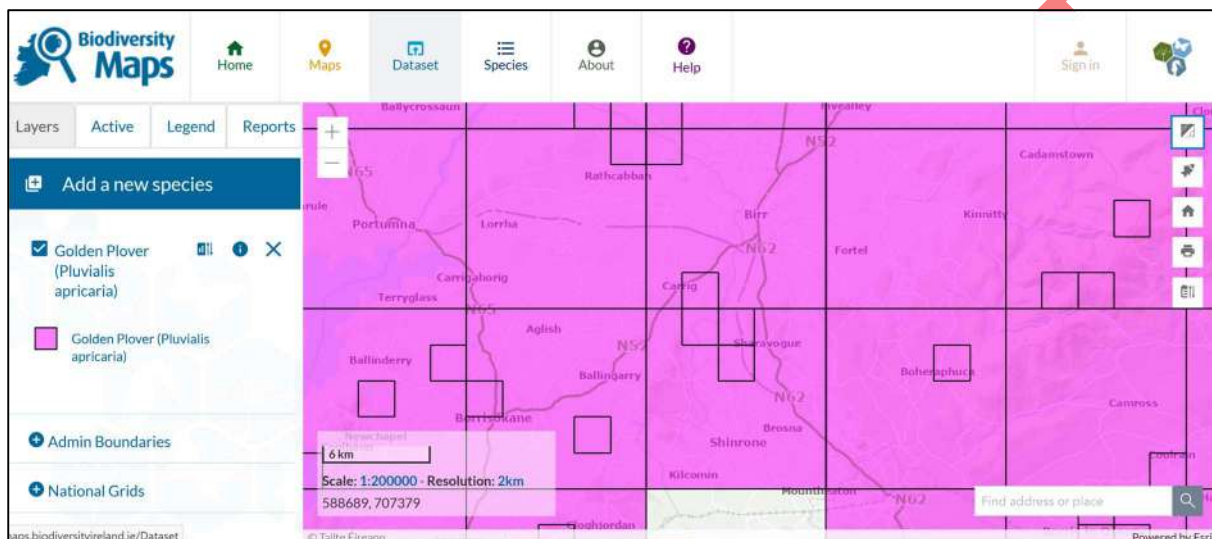


Figure 1: NBDC datacentre records for Golden Plover

3.1.2.2 Greenland White-fronted Goose

According to Section 7.4.2.1.12 of the Ornithology chapter of the EIAR

“...During baseline surveys, the species was rarely recorded, with seven observations within the study area. On three occasions the species was recorded within the proposed project site during the winter season, involving up to two individuals either commuting above or foraging within flooded agricultural fields adjacent to the River Little Brosna. An additional four sightings, involving up to 107 individuals, were recorded within the 10 km buffer at the River Little Brosna Callows SPA during Wetland Bird Surveys (I-WeBS). Although there was the very low level of activity recorded and absence of site use beyond overflight, as Greenland White-fronted Goose are and SCI of three SPAs within the ZOI of the proposed project and that all wild

⁶ [2020] IEHC 622

birds are protected under the EU Birds Directive (2009/147/EC), the species is considered to be of local importance (higher value)..."

During the 2024/2025 season, the Little Brosna site held the third-highest population of Greenland White-fronted Geese in Ireland⁷. Given that the Little Brosna Callows is within the Zone of Interest, supporting an internationally important population of this species, it must be considered of greater importance than "...local importance (higher value)...".

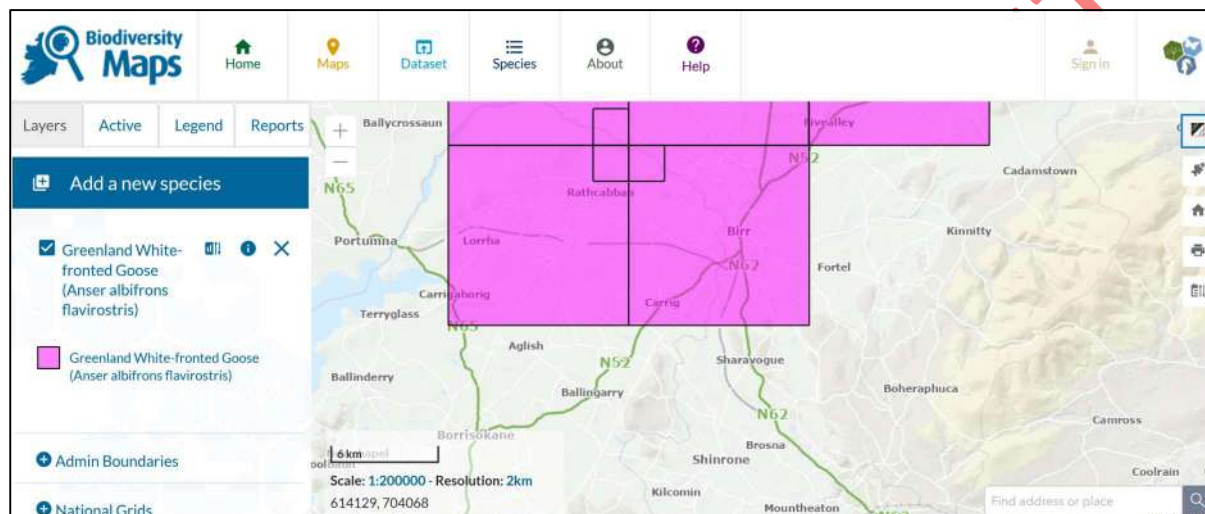


Figure 2: NBDC datacentre records for Greenland White-fronted Geese

3.1.2.3 Lapwing

According to Section 7.4.2.1.19 of the Ornithology chapter of the EIAR

"...Lapwing was occasionally recorded within the study area, with the majority of observations recorded during the winter season. A total of 104 observations were made, involving 8,681 individual birds. Within the proposed project site, records typically involved small flocks of around 10 to 70 individuals, although larger groups of up to 200 birds were recorded. The species was primarily concentrated in the northern and southern parts of the site, particularly in areas of flooded fields and bog, as well as commuting along the Little Brosna River to the east. Additional records of Lapwing were made within the 10 km buffer at the River Little Brosna Callows SPA and Dovegrove Callows SPA during Wetland Bird Surveys (I-WeBS), with flocks reaching up to 2300 individuals. Only a single observation was made during the breeding

⁷ Report of the 2024/2025 international census of Greenland White-fronted Geese.

season (July 2023), which likely related to failed or non-breeding birds from elsewhere, as no breeding activity was recorded at the site prior to, or after this sighting. Based on the level of activity, the size of flocks using the site, and the species' status as an SCI for a downstream SPA, the local population using the site is considered to be of local importance (higher value)..."

Despite the recording of a significant number of Lapwing, there was no multi-year over-winter systematic post-sunset bird surveying undertaken for this species despite the large National decline in the numbers of this species⁸. Lapwing, like Golden Plover, typically forage across farmland at night and the day-time distribution of these species cannot be used to predict post-sunset use of habitats⁹. The Nature Scot Guidelines state

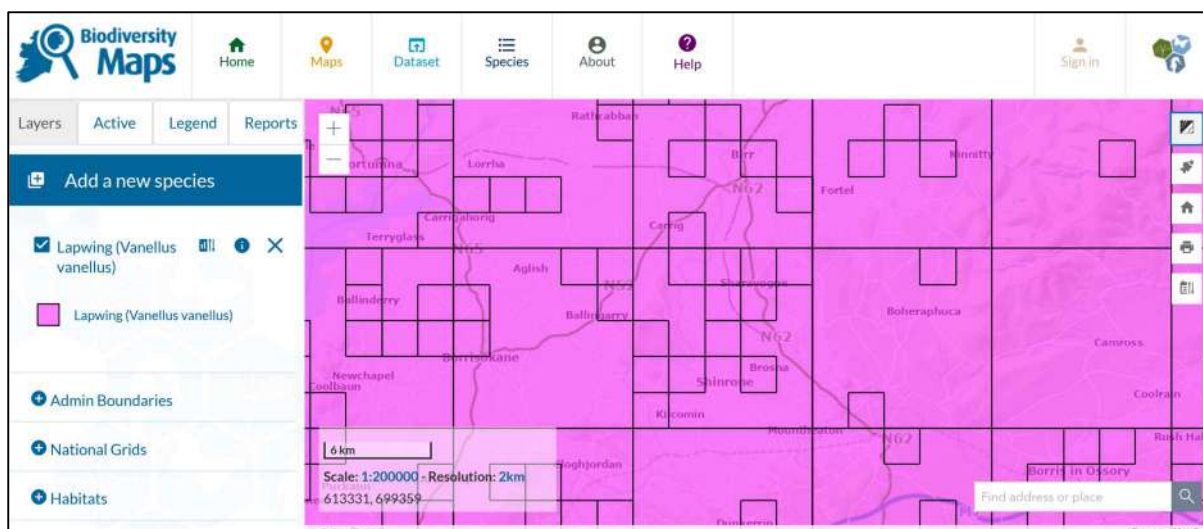
"...For species which are active at dawn and dusk, or at night, other methods of recording or assessing activity need to be employed. Night vision/infra-red equipment and survey on moonlit nights can establish presence of nocturnal species or presence and direction of feeding/migration movements both by calls and by sight..."

Lapwing is a Qualifying Interest of several SPAs proximate to the proposed development. Indeed, the Natura 2000 data form for River Little Brosna Callows SPA (IE0004086) (identified as being within the zone of influence of the development) indicates that the population Lapwing occurring at this site is of excellent value (A) both in terms of Conservation and Global importance. The failure to adequately assess the post-sunset use of the habitats occurring at/near the development site by a Qualifying Interest of proximate SPAs is a critical flaw in the assessment of the ecological resource occurring, with serious ramifications for the conclusions of the EIAR, the Collision Risk Modelling and the NIS prepared in support of the proposed development¹⁰.

⁸ https://birdwatchireland.ie/app/uploads/2023/08/iwebs_trends_00000_National.html

⁹ Gillings S, Fullar R and Sutherland W (2005). Diurnal studies do not predict nocturnal habitat choice and site selection of European Golden Plover (*Pluvialis apricaria*) and Northern Lapwing (*Vanellus vanellus*). *The Auk*, **122**(4), pp 1249 – 1260.

¹⁰ [2020] IEHC 622



3.1.2.4 Whooper Swan

According to Section 7.4.2.1.34 of the Ornithology chapter of the EIA R

"...During baseline surveys, the species was occasionally recorded, with a total of 85 observations involving 744 individuals. Flocks ranged in size from 2 to 11 birds, but up to 55 were recorded. Records were almost entirely confined to the Little Brosna River and adjacent flooded agricultural fields to the northeast of the site. Observations typically involved commuting or foraging birds, often feeding in shallow flooded fields during the winter months. Additionally, Whooper Swan was recorded outside of the proposed project site within the 10 km buffer, including groups of up to 19 individuals at the Dovegrove Callows SPA during Wetland Bird Surveys (I-WeBS). The site provides suitable wintering habitat for this species, particularly in areas of temporary flooding along the river corridor. Based on the number of birds recorded and the foraging activity observed, the site is considered to be of local importance (higher value) for Whooper Swan..."

The methodology as utilised during the winter bird surveys is wholly inadequate and flawed with regard to identifying areas important to crepuscular movements of species commuting to/from foraging and roosting areas. According to the Nature Scot guidelines

“...All bird species have varied seasonal and within day activity patterns. Survey design should be based around the times when birds are likely to be most active...”

Whooper Swan are widely recorded within the vicinity of the proposed development according to the NBDC database (Figure 4) indicating that there are very likely commuting corridors in the vicinity of the proposed development. While Vantage point watches can be utilised to determine regular commuting flights between roosts and foraging areas, the vantage point watches as presented do not satisfy this requirement. It has been established that Whooper Swan move between roosting sites and foraging sites at key times of low light, including before sunrise and after sunset, and even in darkness¹¹. A seminal work on Whooper Swan behavioural ecology, the Ph.D. thesis of Mark Brazil¹², found that with regard to arrival/departure of Whooper Swan to/from feeding grounds

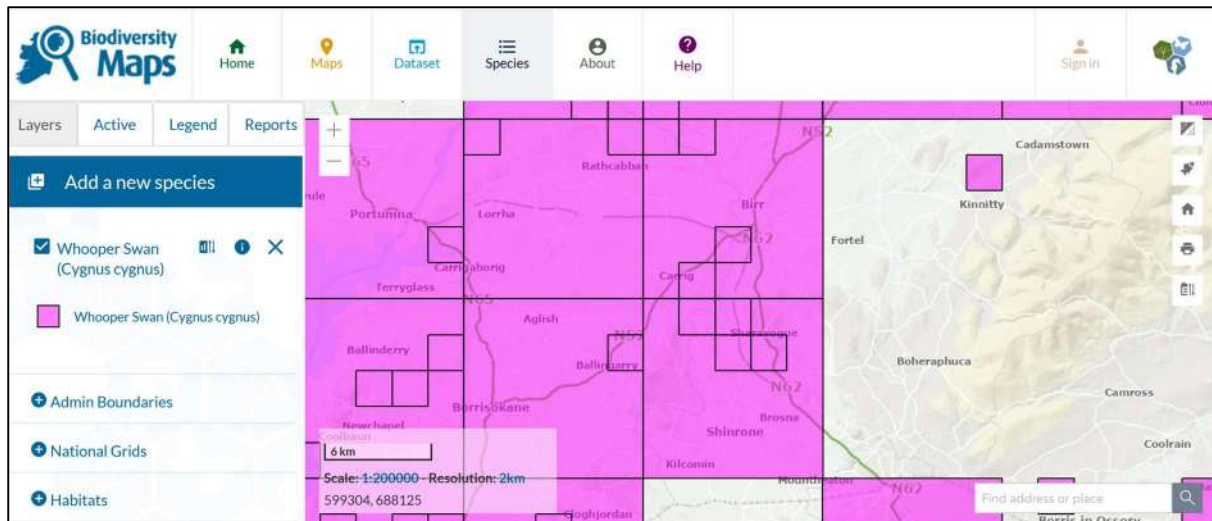
“...Arrivals were evenly distributed throughout the period from 60 min before local sunrise to 10 min. afterwards. Departures were normally distributed, occurring in the period from sunset until 90 min. afterwards...”

Although there is a complete lack of the provision of a table outlining survey times that might be used to establish whether any surveys were undertaken in these key commuting windows, there are no records presented with the EIAR or associated documents that would indicate any surveys were undertaken within the key time intervals identified. Furthermore, Whooper Swans typically fly at low altitudes (often below 15 metres) when commuting between foraging and roosting sites but can increase flight height during conditions of reduced visibility or when anticipating a longer commute (for example during very cold weather when inland water bodies may be frozen-over). Although Whooper Swan were recorded on site, no systematic, multiyear vantage point surveys (and in particular no surveys aimed to identifying birds flying below 15 m) were undertaken at the key times of an hour before sunrise and an hour after sunset in order to identify the importance of the area as a commuting corridor. As such, it cannot be stated with any scientific certainty that the methodology utilised has established the degree of use of the site by commuting Whooper Swan. The failure to adequately assess the use of the habitats occurring at/near the development site by a Qualifying Interest of proximate SPAs is a critical flaw in the assessment of the ecological resource occurring, with serious ramifications for the conclusions of the EIAR, the Collision Risk Modelling and the NIS prepared in support of the proposed development¹³.

¹¹ Rees E, Bruce J and White G (2005). Factors affecting the behavioural responses of whooper swans (*Cygnus c. cygnus*) to various human activities. *Biological Conservation*, **121**, pp 369 - 382

¹² Brazil M (1981). The behavioural ecology of the Whooper Swan (*Cygnus cygnus*). Ph.D. Thesis, University of Stirling, Scotland

¹³ [2020] IEHC 622



Also of note, although Lough Nahinch (a subsite of Ballingarry OJS03) is identified in Figure 7-6 of the EIA ornithology chapter as an I-WeBS site, Birdwatch Ireland indicated ¹⁴ that

"...Ballingarry OJS03 site and subsites are Swan Sites. This means that are only routinely counted for the purpose of the International Swan Census..."

The 2014/15 Swan Census recorded a peak number of 176 Whooper Swan, utilising Ballingarry sub-site at Gurteen Agricultural College (ITM 596,351 699,634). The 2014/15 Swan Census recorded a peak number of 80 Whooper Swan, utilising Ballingarry sub-site Munlusk (ITM 596,451 699,534).

The use of the Ballingarry site, of which Lough Nahinch is a subsite within the I-WeBS network of sites by a peak of almost 200 Whooper Swan (as counted during a Swan Census) would indicate that the Ballingarry site is of ecological importance with regard to Whooper Swan and that there is a significant Source-Pathway-Receptor link between the proposed development and this site. Of note, this degree of Whooper Swan activity should be viewed in light of the numbers utilised to inform the Collision Risk Model (Local – 337, County – 1,506, National – 19,111). The peak number of Whooper Swan recorded at the Ballingarry subsite at Gurteen Agricultural College was, therefore, in excess of 50% of the Local Population and in excess of 10% of the County Population.

¹⁴ *Personal communication with Laura Dargan*

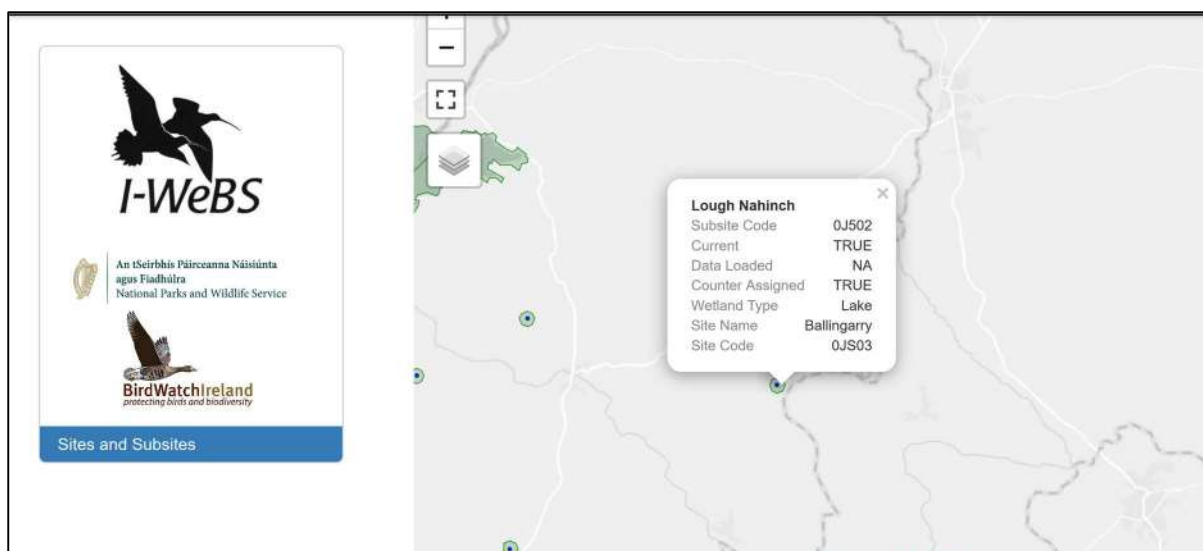


Figure 5: Location of Lough Nahinch subsite

3.1.3 Cumulative impacts – inadequate assessment

When undertaking an EIAR, the totality of the project must be considered, including off-site and secondary projects as well as indirect, secondary and cumulative impacts in accordance with the relevant caselaw¹⁵. A developer must supply information in relation to the environmental impact of both the chosen option and of all the main alternatives studied by the developer, together with the reasons for their choice, considering at least the environmental effects, even if such an alternative was rejected at an early stage¹⁶. A query of the EIA portal¹⁷ of developments/proposed developments proximate to the proposed development indicates that in accordance with Section 37E of the Planning and Development Act 2000, as amended, Uisce Éireann has given notice of its intention to make an application for permission to An Coimisiún Pleanála in relation to a Strategic Infrastructure Development (SID) adjacent to the proposed development (Figure 6). This Proposed Development will primarily consist of a proposed Raw Water Intake & Pumping Station at Garrynatineel, Ballina, Co. Tipperary; a proposed Water Treatment Plant at Incha Beg, Birdhill, Co. Tipperary; a proposed Break Pressure Tank at Knockanacree, CloughJordan, Co. Tipperary; a proposed Booster Pumping Station at Coagh Upper, Birr, Co. Offaly; a proposed Flow Control Valve at Commons Upper, Celbridge, Co. Kildare; a proposed Termination Point Reservoir at Loughtown Upper, Peamount, County Dublin; c. 172km of pipeline connecting the water infrastructure sites; uprating and associated works to the

¹⁵ [2014] IEHC 632

¹⁶ C-461/17

¹⁷ <https://housinggov.ie/maps.arcgis.com/apps/webappviewer/index.html?id=d7d5a3d48f104ecbb206e7e5f84b71f1>

existing Ardnacrusha – Birdhill 38kV line and Ardnacrusha – Birdhill – Nenagh 38kV line, works at the existing Birdhill 38 kV electricity substation, power connections to infrastructure and all ancillary works above and below ground. The potential impact of this project on proximate SPAs, including the River Little Brosna Callows SPA has been identified in the EIAR and NIS. The failure of the Ornithology Chapter of the EIAR (or indeed the NIS) to identify any potential for cumulative or in-combination impacts/effects must be construed as a fatal flaw.

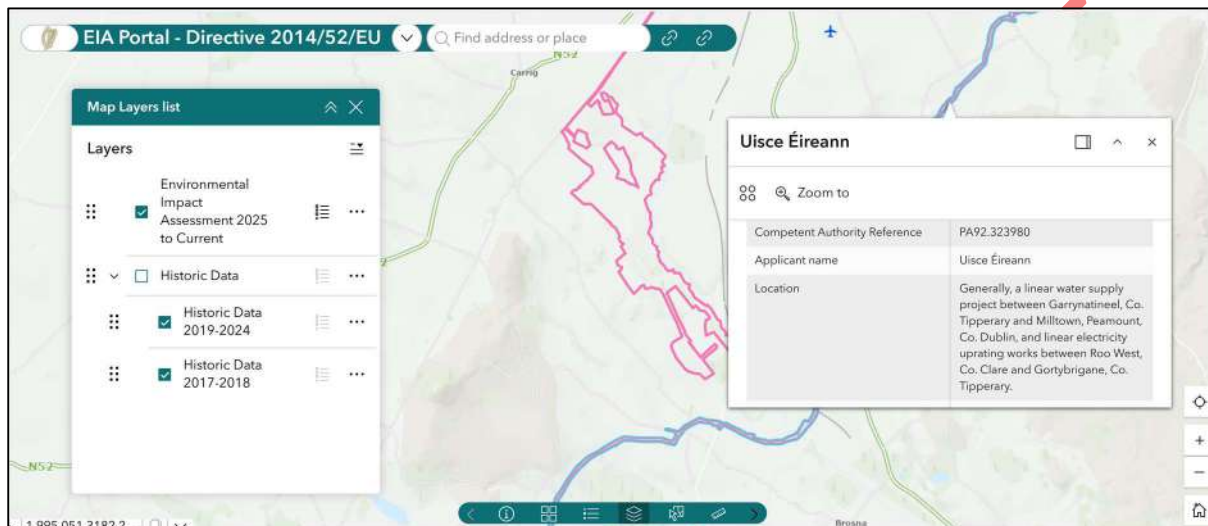


Figure 6: Excerpt from EIA Portal, indicating location of major Strategic Infrastructure Development adjacent to proposed development that was not considered with regard to cumulative/in-combination impacts/effects

3.2 Impact of inadequate bird surveys on Collision Risk Modelling Report

The Collision Risk Model as prepared by Dr Tom Gittings is an excellent analysis of a scientific assessment of risk. The quality of data informing the collision risk model, however, does not comply with the standards as outlined in the guidance used, and the impact of this poor-quality data must be considered. Within the summary of the CRM it is stated

“...The collision risk model was based on nine seasons of vantage point survey data from up to seven vantage points with a survey effort of around six hours / month / vantage point. The NatureScot model was used. As well calculating predicted collision risks, the uncertainty ranges around the estimates were quantified. Collision risks that would cause a 1% or greater increase in mortality to the affected population were considered potentially significant...”

Within the introduction, however, it is stated that with regard to limitations

*“...The methodology of most of the vantage point surveys carried out for this project deviated in a number of respects from the recommended methodology (NatureScot, 2025a). Conservative assumptions have been applied **where possible** in this collision risk model to address the implications of these deviations, as described in the relevant sections of this report...”*

On page 7-22 of the Ballincor EIAR Ornithology Chapter it is stated that with regard to survey limitations

“...The viewshed analysis was based on shapefiles of vantage point locations and viewshed arcs provided by Ecology Ireland, but the original arcs did not align precisely with the recorded vantage points. To improve spatial accuracy, new arcs were generated using the directional angles of the original arc boundaries, and a 10m buffer was applied to smooth the viewshed edges and maintain coverage...”

An Coimisiún Pleanála should note that the co-ordinates utilised for Vantage Points are not presented within any of the documentation submitted. Within the Nature Scot Guidelines¹⁸, which are referred to repeatedly in the Ballincor EIAR Ornithology Chapter and the Collision Risk Modelling undertaken it is stated that

¹⁸ <https://www.nature.scot/doc/recommended-bird-survey-methods-inform-impact-assessment-onshore-windfarms#8-vantage-point-survey>

“...Changing the VP location complicates collision risk analysis and assumptions cannot be made that viewshed (the view visible from the VP location) areas will be the same. It is therefore critical that the spatial coordinates of VP positions are measured to the highest level of accuracy using a GPS. The VP locations and associated viewsheds referred to in the environmental statement must be those used in the field....”

The spatial coordinates of Vantage Point positions, the method by which these Vantage Point positions were measured or the continuity of use is not addressed in the documents presented, even within the CRM, which is entirely dependent on the precision and accuracy with which Vantage Points were utilised.

The Collision Risk Model, although it applies precautionary assumptions, is based on fundamentally flawed Ornithological surveys and as such cannot be considered to be a scientifically robust assessment of the potential impact of the proposed wind farm on the local avifaunal resource.

3.3 Impact of inadequate bird surveys on Appropriate Assessment process

THIS SECTION REQUIRES MORE WORK, EITHER WITH THE DATA REQUESTED, OR IN THE ABSENCE OF SAID DATA IF NOT PROVIDED, UTILISING VIEWSHED ANALYSIS TO DEMONSTRATE WHAT WAS VISIBLE AND WHAT WAS NOT.

The granting of development consent by the Relevant Authority following appropriate assessment (AA) is conditional on the removal of all scientific doubt regarding potential adverse impacts on any Natura 2000 sites concerned, and the Relevant Authority must establish that specific scientific findings exist that permit this removal of doubt¹⁹. The appropriate assessment screening and Natura Impact Statement provided in support of the planning application are informed by the EIAR, and in particular the Ornithology Chapter (the inadequacies of which pervade the Collision Risk Model prepared and Appropriate Assessment). The Appropriate Assessment Screening report and Natura Impact Statement prepared in relation to the proposed development are wholly inadequate and fatally flawed, containing numerous gaps, emissions and *lacunae*. Granting of development consent would, therefore, be unlawful²⁰. This peer-review has focussed primarily on avifauna.

¹⁹ [2014] IEHC 400, [2018] IESC 31

²⁰ C-258/11

The Appropriate Assessment Screening report and Natura Impact Statement provided are informed by a wholly inadequate suite of surveys undertaken with regard to avifauna. The surveys were undertaken over an appropriate period, providing in theory, results based on nine seasons of vantage point survey data from up to seven vantage points with a survey effort of around six hours / month / vantage point. The methodology utilised, however, and the data resulting from these surveys cannot be considered to be of sufficient quality for the removal of scientific doubt regarding potential adverse impacts on the Natura 2000 sites concerned. Examples of these flaws in survey design are presented in the following sections

- 1) **Disregarding S-P-R linkages** - The Appropriate Assessment screening process has identified that there is no viable pathway between the proposed development and the Lough Derg North-east Shore SAC (002241). The Appropriate Assessment screening process has identified that there are viable pathways between the proposed development and the Lough Derg (Shannon) SPA (004058), the Middle Shannon Callows SPA (004096) and the River Shannon Callows SAC (000216). The Conservation Objectives document for the Lough Derg North-east Shore SAC states specifically that *"...Please note that this SAC overlaps with Lough Derg (Shannon) SPA (004058) and Middle Shannon Callows SPA (004096) and is adjacent to River Shannon Callows SAC (000216) and Barrougher Bog SAC (000231). See map 2. The conservation objectives for this site should be used in conjunction with those for the overlapping and adjacent sites as appropriate..."*.

The Appropriate Assessment screening process found that there was no S-P-R linkage between the proposed development and the Slieve Bloom Mountains SPA (004160) as the proposed development site is located approximately 10km from the Natura 2000 site and was

thus outside of the foraging range of this species. The NBDC data centre mapping clearly indicates that Hen Harrier are frequently recorded in the vicinity.

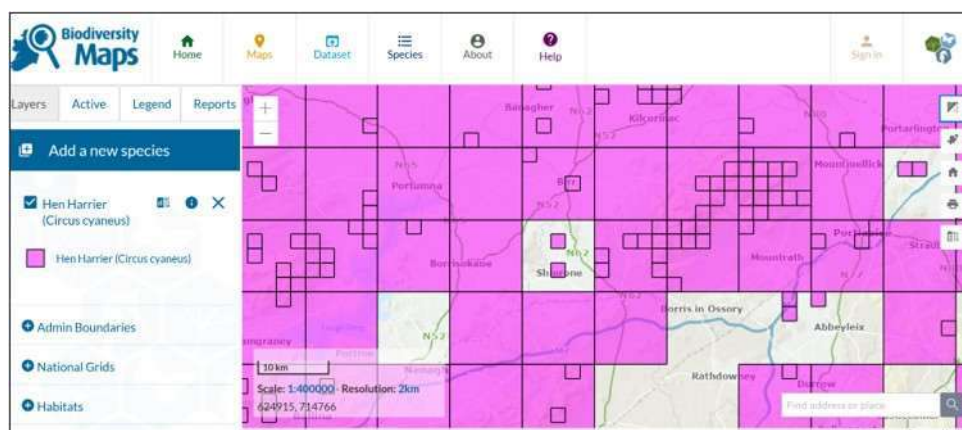


Figure 7: Excerpt from NBDC database of Hen Harrier records

The results of the bird surveys undertaken have recorded Hen Harrier utilising the site/environs during the winter. The most recent research on Hen Harrier distribution in Ireland²¹ has indicated that with regard to Hen Harrier ‘...Across Europe, the hen harrier is subject to a range of ongoing pressures and threats. The main drivers of its decline are the ongoing loss and degradation of suitable nesting, foraging, and wintering habitats...’. The Hen Harrier Threat Response Plan²² indicates that “...There is much overlap in the distribution of breeding and wintering Hen Harrier in Ireland, with the wintering distribution more dispersed and encompassing a wider range, throughout the uplands and lowlands. In the winter, non-breeding Hen Harrier predominantly roost in heath/bog habitats (53%), settling to rest on the ground at night, and often roost communally. The Hen Harrier typically forages over ground that is rich in prey (e.g. medium and small-sized birds, small mammals), such as grasslands and winter stubble. As mentioned previously, juvenile survival overwinter is poor, and recruitment into the breeding population is thus lower than needed to maintain a stable population. There are a number of significant information gaps with respect to the ecology of wintering Hen Harrier. While progress has been made in recent years, more remains to be

²¹ Ruddock, M., Wilson-Parr, R., Lusby, J., Connolly, F., J. Bailey, & O’Toole, L. (2024). The 2022 National Survey of breeding Hen Harrier in Ireland. Report prepared by Irish Raptor Study Group (IRSG), BirdWatch Ireland (BWI), Golden Eagle Trust (GET) for National Parks & Wildlife Service (NPWS). Irish Wildlife Manuals, No. 147. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Ireland.

²² <https://www.npws.ie/sites/default/files/publications/pdf/hen-harrier-threat-response-plan-final.pdf>

done...". Furthermore, this Plan indicates that Wind Energy Production has the potential to impact on both wintering and breeding Hen Harrier.

To discount a Source-Pathway-Receptor linkage between the proposed development site and the Slieve Bloom Mountains SPA owing to the fact that it is outside of the (summer) foraging limits from the site must be considered to be a significant omission.

- 2) Section 5.1.2.1 of the Appropriate Assessment screening document recognises one of the potential impacts of the proposed development as being

"... The presence of turbines in the landscape could potentially cause disturbance impacts to species using the area and its surroundings, resulting in a disturbance displacement effect. This effect can be particularly significant for avian species..."

Neither the AA screening, nor the NIS contain any consideration of *ex-situ* impacts on birds foraging within the survey area or commuting through survey area at night. No adequate survey effort was undertaken to establish if Golden Plover or Lapwing, both species Qualifying Interests of proximate Special Protection Areas, utilise the development site or *environs* post-sunset for foraging or commuting purposes. Day-time distribution of these species cannot be used to predict post-sunset use of habitats²³. The failure to thoroughly assess *ex-situ* impacts on these Qualifying Interests and consider indirect impacts on the Conservation Objectives of the proximate SPAs must be considered a fatal flaw in the AA process as relates to the proposed development²⁴.

- 3) According to EU Guidelines²⁵ one of the primary steps in the AA screening process is identification of negative pressures and/or threats with impacts on designated sites and

"...The information provided in the Natura 2000 standard data form is the starting point for identifying the habitat types and species that are significantly present on the site and that could be affected by the plan or project, as well as any existing pressures and impacts on the site..."

Although this information is readily available online²⁶, the AA process would appear to fail to consult Natura 2000 data forms to consider these threats, pressures and activities (internal

²³ Gillings S, Fullar R and Sutherland W (2005). Diurnal studies do not predict nocturnal habitat choice and site selection of European Golden Plover (*Pluvialis apricaria*) and Northern Lapwing (*Vanellus vanellus*). *The Auk*, **122**(4), pp 1249 – 1260.

²⁴ IEHC [2020] 622

²⁵ Commission Notice - Assessment of plans and projects in relation to Natura 2000 sites – Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC (2021/C 437/01)

²⁶ <https://natura2000.eea.europa.eu/>

and external) with impacts on the sites as comprehensively detailed in the relevant Natura 2000 data-forms. This must be seen as a fatal flaw in the AA process.

- 4) The SPAs within the zone of influence of the proposed development are primarily designated for over-wintering bird populations utilising the habitat for roosting/foraging. Changes in water levels associated with Climate Change will impact on the availability of the distribution of these habitat, displacing foraging populations of bird species comprising qualifying interests. According to EU Guidance²⁷, ‘...*Deterioration is any form of degradation affecting a habitat. The Member State has to take into consideration all the influences on the environment hosting the habitats...*’. Caselaw²⁸ has identified that

“...it may be necessary to adopt both measures intended to avoid external man-caused impairment and disturbance and measures to prevent natural developments that may cause the conservation status of species and habitats in SACs to deteriorate...”.

Furthermore, guidance indicates that potential modifications of Natura 2000 sites linked to climate change should be assessed case-by-case²⁹. The AA of the proposed development (which pertains to renewable energy as a means to combat climate change) has given no cognisance to the potential impact of climate change on the Conservation Objectives of Qualifying Interests of the relevant Natura 2000 sites (both SACs and SPAs), nor on the potential impacts on, for example, changes in species distribution or flight paths.

²⁷ Commission notice "Managing Natura 2000 sites The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC, Brussels, 21.11.2018 C (2018) 7621 final.

²⁸ C-6/04

²⁹ See guidance on Climate change and Natura 2000 at <http://ec.europa.eu/environment/nature/climatechange/pdf/Guidance%20document.pdf>

4 Conclusion

Despite the nature of the proposed development, it is the opinion of the author of this report, that the conclusions of both the EIAR and the NIS prepared with regard the planning permission application for the Ballincor Wind Farm are fundamentally and critically flawed owing to the wholly inadequate methodologies utilised to undertake the surveys of the avifaunal resource occurring. The documents as provided cannot sufficiently inform an Environmental Impact Assessment or Appropriate Assessment of the proposed development by the Competent Authority, owing to a combination of factors, including the lack of adequate information to assess the potential impact of the proposed project, alone or in combination with other plans/projects on the environment and/or Natura 2000 network. It is respectfully requested that An Coimisiún Pleanála consider the lack of appropriate surveying with regard to assessing the potential impact of the proposed development in relation to avifauna.

DRAFT FOR COMMENT



Ballincor Wind Farm

Co. Tipperary & Co. Offaly

Planning Stage Environmental Impact Assessment Report (EIAR) Chapter 11 Review

19 June 2026

Greater BIRR Wind Action Group

Report Author: Dirun Ergin

Report: DC2769-RT01

Report Control

Document Title:	Planning Stage Environmental Impact Assessment Report (EIAR) Chapter 11 Review

Project:	Ballincor Wind Farm

Client:	Greater BIRR Wind Action Group

Job Number:	DC2769-RT01

Report Author:	Dirun Ergin BA MSc MIOA

Signed:	

Date:	19 June 2026

Issue	Date	Status	Checked By	Signed
1	19/06/2026	For Information	Stephen Kearney BE MIEI MIOA	
2				
3				
4				

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1 Introduction

Allegro Acoustics was commissioned by the Greater BIRR Wind Action Group to complete an Acoustic Review of the Environmental Impact Assessment Report (EIAR) Chapter 11 and the associated appendices from the Planning Application documents for the Ballincor Wind Farm development (Case Reference Number: PAX92.324279). The site for the development is shown in Figure 1 below.

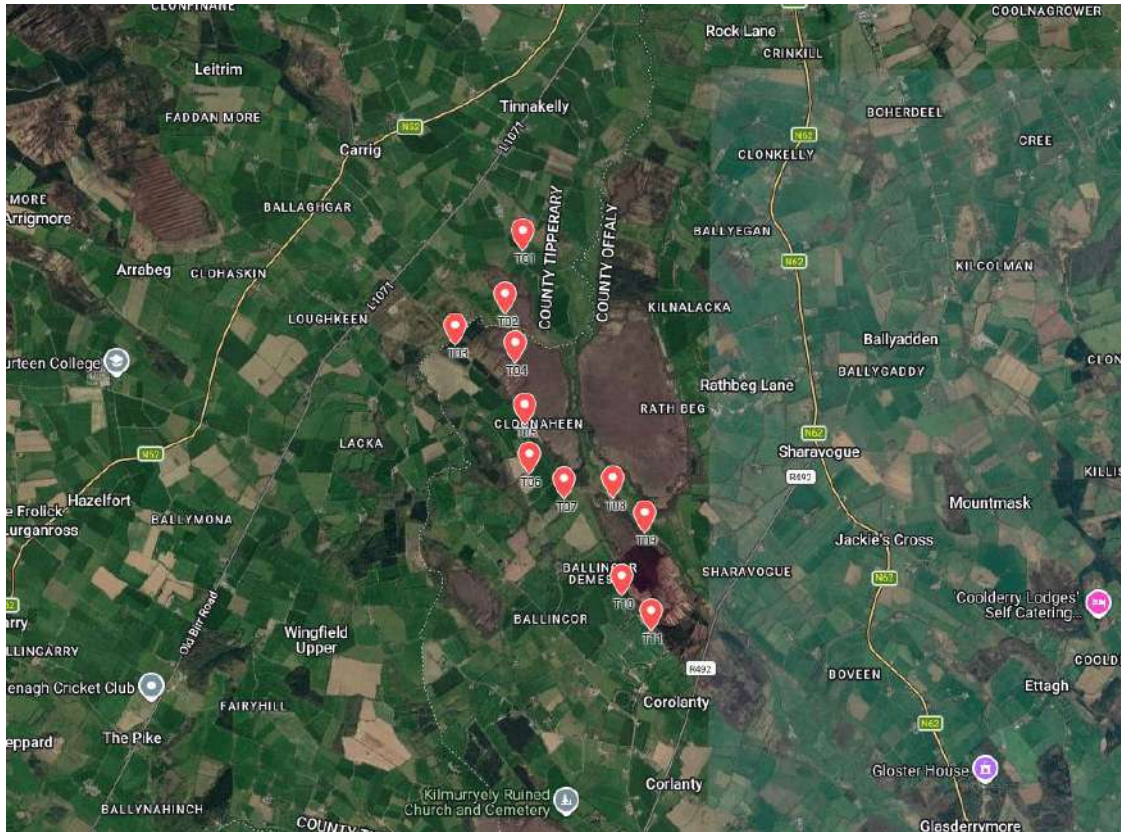


Figure 1: Graphic depicting the site of the Ballincor Wind Farm and wind turbine locations.

This report includes our assessment based on guidance outlined in the following standards and guideline documents:

- Department of Trade & Industry (UK) Energy Technology Support Unit, *The Assessment and Rating of Noise from Wind Farms* (ETSU-R-97) [1].
- Institute of Acoustics, *A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise* [2].
- The Department of the Environment, Heritage and Local Government, *Wind Energy Development Guidelines* [3].

The documents reviewed are listed as follows:

- Ballincor Wind Farm Planning Statement
- Ballincor Wind Farm EIAR Chapter 11: Noise and Vibration
- Ballincor Wind Farm EIAR Chapter 11 Appendix 3: Background Noise Survey
- Ballincor Wind Farm EIAR Chapter 11 Appendix 4: Noise Prediction Calculation Methodology, Inputs and Assumptions
- Ballincor Wind Farm EIAR Chapter 11 Appendix 5: Assigned Limits
- Ballincor Wind Farm EIAR Chapter 11 Appendix 6: Noise Prediction Results

2 Suitably Qualified Consultants

This response was written by Dirun Ergin and reviewed by Stephen Kearney. Dirun is the Principal Acoustic Consultant and Stephen is the Technical Director at Allegro Acoustics. Summaries of their qualifications and experience are presented in Table 1 below.

Qualifications and Experience of the Report Author and the Report Reviewer

Stephen Kearney BEng MIEI MIOA

Technical Director at Allegro Acoustics

Qualifications:

- Postgraduate Diploma in Acoustics and Noise Control from Trinity College Dublin and the Institute of Acoustics (IOA) (Hons 1:1, 2016)
- Bachelor's Degree in Energy Systems Engineering from National University of Ireland, Galway (Hons 2:1 2014)

Professional Memberships:

- Member of Engineers Ireland (MIEI)
- Member of the Institute of Acoustics (MIOA)

Experience:

Stephen has 12 years' experience working on the acoustic design of Power Generation & Renewables, Data Centre, Commercial, Residential and Education developments.

Dirun Ergin BA MSc MIOA

Principal Acoustic Consultant at Allegro Acoustics

Qualifications:

- Master's Degree in Architectural Acoustics from Yildiz Technical University, Turkey (2011)
- Bachelor's Degree in Interior Architecture and Environmental Design from Bilkent University, Turkey (2009)

Professional Memberships:

- Member of the Institute of Acoustics (MIOA)
- Member of Turkish Acoustic Association

Experience:

Dirun has 13 years' experience working on the acoustic design of Arts & Performance, Commercial, Corporate, Residential, Education, Hospitality, Public and Healthcare developments.

Table 1: Qualifications and experience of the report author and the report reviewer.

3 Acoustic Review of the EIAR Chapter 11

Allegro Acoustics has reviewed the Noise and Vibration chapter (Chapter 11) and relevant appendices (Appendix 3, 4, 5, 6) of the Environmental Impact Assessment Report for the Ballincor Wind Farm development. This section includes our opinion on the compliance of the reviewed report with the best practice guideline documents for wind farm developments.

3.1 Existing Environment (Section 11.5)

3.1.1 Summary of Derived Background Noise Levels (Section 11.5.1)

It is seen in the EIAR and Appendix 11.3 (Background Noise Survey) that the maximum wind speed while deriving the background noise levels was limited to 9m/s. As shown in Figure 2 below, IOA recommends the upper level of the wind speed to be either 12m/s or the proposed wind turbine's maximum sound power level [2].

- 2.9.3 Therefore the recommended minimum wind speed range (10 m standardised) for background noise surveys is:
- For pitch-regulated turbines: between cut-in wind speed and the wind speed corresponding to its maximum sound power level.
 - For stall-regulated turbines: between cut-in wind speed and 12 m/s.

Figure 2: Extract from IOA GPG about Background Data Collection – Duration of Surveys [2].

It is also seen on the Appendix 11.4 (Noise Prediction Calculation Methodology, Inputs and Assumptions) that, the sound power level of the proposed wind turbine is the same for the wind speed 7m/s and higher.

Wind Speed (m/s at 10m Standardised Height)	Octave Bank Centre Frequency (Hz)								dB L_{WA}
	63	125	250	500	1000	2000	4000	8000	
3	77.0	84.6	86.7	87.9	89.7	90.4	84.8	70.4	95.8
4	78.3	85.9	88.0	89.2	91.0	91.7	86.1	71.7	97.1
5	82.9	90.5	92.6	93.8	95.6	96.3	90.7	76.3	101.7
6	87.3	94.9	97.0	98.2	100.0	100.7	95.1	80.7	106.1
7	88.6	96.2	98.3	99.5	101.3	102.0	96.4	82.0	107.4
8	88.6	96.2	98.3	99.5	101.3	102.0	96.4	82.0	107.4
≥9	88.6	96.2	98.3	99.5	101.3	102.0	96.4	82.0	107.4

Figure 3: Extract from EIAR Appendix 11.4 – the turbine sound power noise emission values.

As it is depicted in Figure 4, The EIAR states that the wind speed of 9m/s is the point where the turbine reaches its maximum sound power level.

Table 11-11 outlines the operational noise limits derived for the assessment in accordance with applicable criteria. Turbine noise limits have been established for wind speeds between 3 and 9 m/s, covering the range from turbine cut-in up to the point where the turbine reaches its maximum sound power level.

In the absence of measured background noise data above 9 m/s, a conservative approach assumes that the background noise levels derived at 9 m/s apply at higher wind speeds. However, it is expected that as wind speeds increase beyond 9 m/s, background noise levels will also rise.

Figure 4: Extract from EIAR Wind Turbine Noise Limits – Assigning Representative Background Noise Levels

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.nordex-online.com/en/product/n163-5-x/>). Therefore, we ask the applicant to confirm that the maximum sound power levels presented 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.

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.

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 above.

3.1.2 Wind Turbine Noise Limits (Section 11.5.2)

In the planning statement, the applicant confirms that the predicted operational noise levels will comply with the applicable WEDG06 guidelines as demonstrated in Figure 5.

Based on detailed information on the site layout, turbine noise emission levels and turbine hub height, turbine noise levels have been predicted at NSLs for a range of operational wind speeds. The predicted noise levels associated with the proposed project will be within the noise criteria stated in the applicable WEDG06s guidelines. Therefore, it is not considered that a significant effect is associated with the development.

Figure 5: Extract from the Ballincor Wind Farm Planning Statement

The applicable criteria outlined in WEDG06 is presented in Figure 6 and the noise limits set out by the applicant are shown in Figure 7 [3].

In general, a lower fixed limit of 45 dB(A)¹⁰ or a maximum increase of 5dB(A) above background noise at nearby noise sensitive locations is considered appropriate to provide protection to wind energy development neighbours. However, in very quiet areas, the use of a margin of 5dB(A) above background noise at nearby noise sensitive properties is not necessary to offer a reasonable degree of protection and may unduly restrict wind energy developments which should be recognised as having wider national and global benefits. Instead, in low noise environments where background noise is less than 30 dB(A), it is recommended that the daytime level of the LA90, 10min of the wind energy development noise be limited to an absolute level within the range of 35-40 dB(A).

Separate noise limits should apply for day-time and for night-time. During the night the protection of external amenity becomes less important and the emphasis should be on preventing sleep disturbance. A fixed limit of 43dB(A) will protect sleep inside properties during the night.

Figure 6: Extract from the Wind Energy Development Guidelines [3].

Table 11-11: Proposed Noise Criteria Curves

Location	Period	Turbine Noise Limits LA90,10min Levels (dB) at Various Standardised 10m Height Wind Speeds						
		3	4	5	6	7	8	≥9
NML 1	Day	40	40	40	45	45	45	45.6
	Night	43	43	43	43	43	43	43
NML 2	Day	40	40	40	40	45	45	45
	Night	43	43	43	43	43	43	43
NML 3	Day	40	40	45	45	45	46.6	50.8
	Night	43	43	43	43	43	45.5	45.5
NML 4	Day	40	40	40	45	45	45	45.8
	Night	43	43	43	43	43	43	43
NML 5	Day	40	40	45	45	45	48.4	52.2
	Night	43	43	43	43	43	45.4	45.4
NML 6	Day	40	40	45	45	45	46.1	51.1
	Night	43	43	43	43	43	43.2	43.2
NML 7	Day	40	40	45	45	47.2	52.6	52.6
	Night	43	43	43	43	44.3	45.3	45.3

Figure 7: Extract from EIAR Wind Turbine Noise Limits – Assigning Representative Background Noise Levels, Proposed Noise Criteria Curves

Comment 3: For low noise environments where background noise is less than 30dBA WEDG06 recommends a daytime noise criteria of 35-40dBA. The applicant has recommended the upper limit of 40dBA be applied. Considering that the measured background day time noise level is as low as 23.9dB at low windspeeds, it may be worth applying a criteria that is at the lower end of this threshold (35dBA) for wind speeds that result in a background noise level that is significantly below the 30dBA threshold.

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 18.8dBA measured during nighttime hours at low wind speeds. As such applying a fixed noise limit of 43dBA 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 43dBA fixed limit in cases where the existing background nighttime noise level is extremely low.

3.2 Assessment of Effects (Section 11.6)

3.2.1 Operational Phase (Section 11.6.4)

In accordance with the IOA GPG, a +3 dB correction must be applied to account for sound propagating across a valley or concave ground profile.

4.3.9 A further correction of +3 dB (or +1.5 dB if using $G=0.0$) should be added to the calculated overall A-weighted noise level for propagation "across a valley", i.e. a concave ground profile, or where the ground falls away significantly, between the turbine and the receiver location. The following criterion^{viii} of application is recommended:

$$h_m \geq 1.5 \times (\text{abs}(h_s - h_r) / 2)$$

where h_m is the mean height above the ground of the direct line of sight from the receiver to the source (as defined in ISO 9613-2, Figure 3), and h_s and h_r are the heights above local ground level of the source and receiver respectively. This may be calculated using standard topographic data with a resolution of 50 m or less. Care needs to be exercised when evaluating this condition, as small changes in distance and height may trigger (or not) the criterion when the actual situation has not changed significantly. Examination of ground profiles between sources and receivers can assist in determining its application.

Figure 8: Extract from IOA GPG – Noise Propagation Model and Input Parameters [2].

Comment 6: We ask the applicant to submit further calculations and assessment to determine whether this topographical 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.

3.3 Noise Prediction Results (Appendix 11.6)

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.

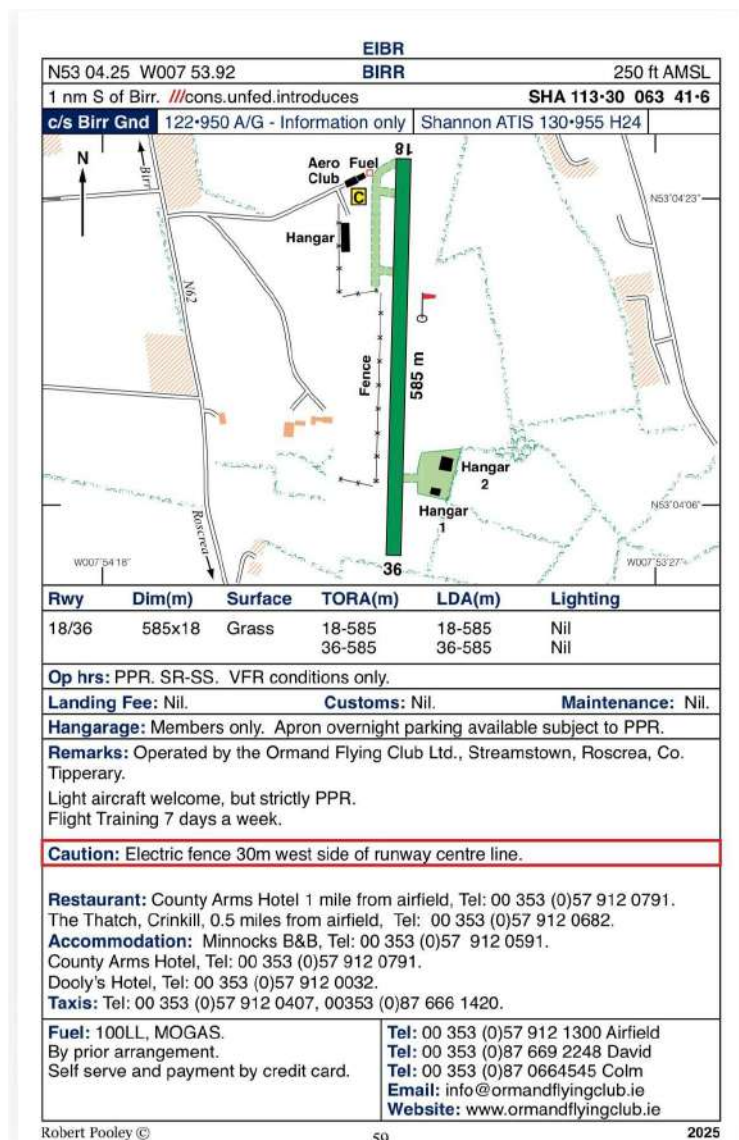
Comment 7: We ask the applicant to explain why the above mentioned noise sensitive locations were excluded from the assessment.

4 References

- [1] Department of Trade & Industry (UK) Energy Technology Support Unit (ETSU), "The Assessment and Rating of Noise from Wind Farms (ETSU-R-97)," September 1996.
- [2] Institute of Acoustics, "A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise," May 2013.
- [3] Department of the Environment, Heritage and Local Government, "Wind Energy Development Guidelines," 2006.

1. History and Context

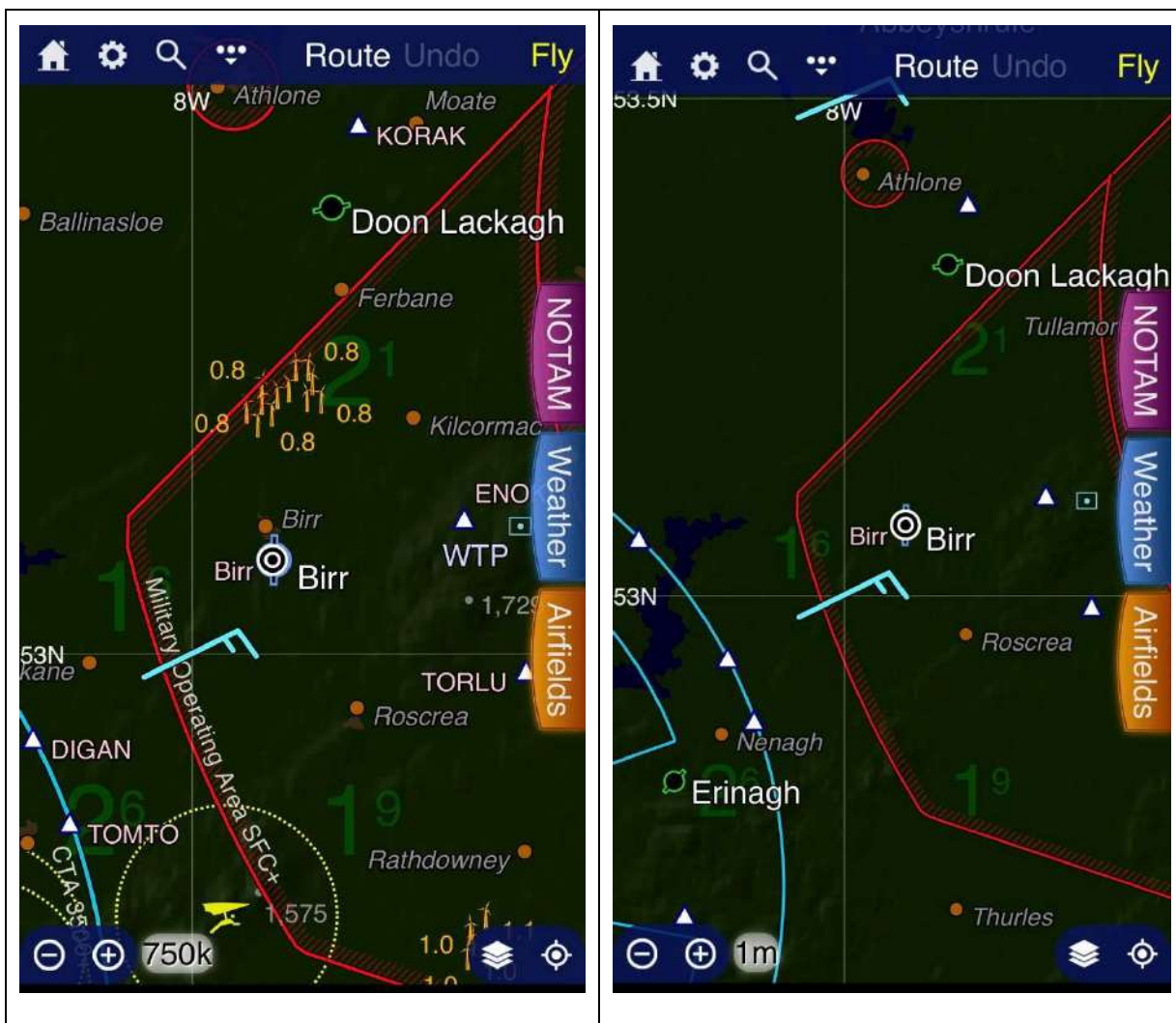
Ormand Flying Club has operated from Birr Aerodrome (official designation EIBR under the International Civil Aviation Organisation) for over fifty years. The airfield is located approximately one nautical mile south of Birr, County Offaly, and is licensed by the Irish Aviation Authority. The club holds Designated Training Organisation status, also granted by the Irish Aviation Authority and trains pilots to Private Pilot Licence standard in accordance with EASA (European Aviation Safety Agency) regulations. This is the Pooleys Plate – Aerodrome Chart for Birr. EIBR is the identifier for Birr Aerodrome.



The airfield operates a single grass runway orientated north–south (designated 18/36), approximately 585 metres in length, at an elevation of approximately 250 feet above mean sea

level. Operations are conducted under Visual Flight Rules only. There is no air traffic control service thus separation from other traffic and obstacles is achieved by pilots through visual reference and situational awareness. This is the standard operating model for general aviation training aerodromes throughout Ireland.

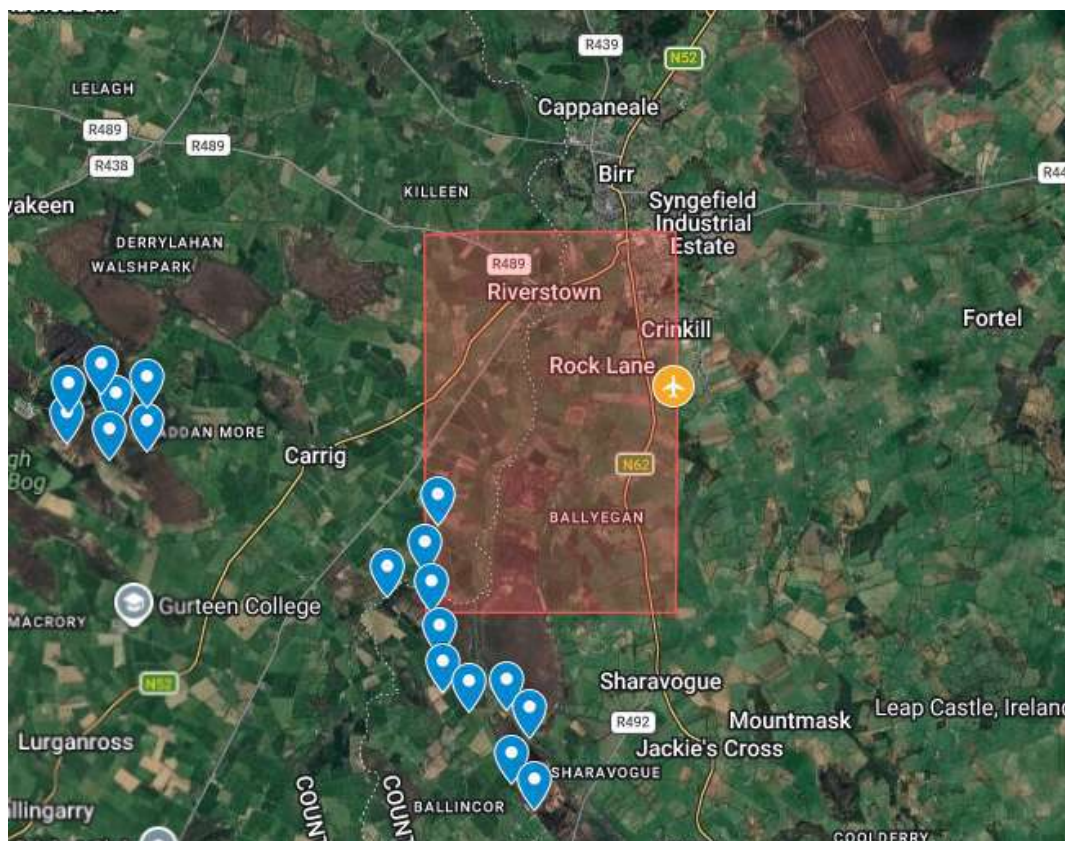
The club is widely regarded as the oldest grass-runway flying club in Ireland. Its activities include pilot training, skydiving operations, recreational flying by members and visiting pilots, regular fly-in events and airshows that attract attendance from across Ireland. The aerodrome has been used for helicopter emergency and rescue services when responding to tasks in the local area and operates within a designated Military Defence Operating Area (see MOA5 Military Operating Area 5 map below).



These characteristics place Birr Aerodrome in a category of airfield that warrants particular consideration in any planning process involving tall structures in the surrounding area. The proposed Ballincor WindFarm development, if permitted, would introduce structures of

approximately 180 metres or greater in overall tip height within airspace that is routinely and necessarily used by aircraft operating from Birr Aerodrome.

The map below illustrates the aerodrome traffic circuit area utilised for training operations at Birr Aerodrome. Please note the proximity and overlap with the proposed wind farm development - T1 a distance of 3.8km / 2 nautical miles away.



The Red Box references the flying and training area

2. Failure of Consultation

According to ACP official records (ABP318666-23) a pre-application consultation meeting was held between RWE representatives and ACP on February 22nd 2024. The matter of the Airfield was raised by the ACP Board where they noted the sites proximity to the Airfield and the need for RWE to consider this in the proposal and submission. See below.

- The Boards representatives discussed the location of the proposed site and asked the prospective applicant if they have assessed wind speeds and has this been taken into consideration in the proposed turbine layout. The prospective applicant stated that they have had wind monitoring devices on site for over 2 years and have been monitoring data collected.
- The Boards representatives pointed out the presence of an airfield located northeast of the proposed development site. They questioned if this airfield is still in operation. The prospective applicant stated that they will take the airfield into account in their assessment.
- The Boards representatives noted the presence of peat on the subject site and stressed the importance that a robust assessment of peat stability be carried out as this could be a significant issue. This issue should be comprehensively addressed in the environmental impact assessment report. The prospective applicant stated that although peat partly overlies the proposed site, there is only one single turbine that will be located on peat. All other turbines will be located on lands currently occupied by forestry, notwithstanding this, the applicant will carry on a robust peat stability risk assessment for this turbine.

A second meeting occurred with ACP on May 7th 2025 where RWE claims "Birr Airfield is located outside of their zone of influence". See below. They also advised that they had consulted with the Airfield and provided a layout of proposed turbine locations.

- Following on from a point raised by the Board's representatives, the prospective applicant advised that the proposed development is located approx. 3km from the Birr Airfield and is located outside of their zone of influence. They also advised that they have consulted with the Airfield and provided them with a layout of the proposed turbine locations.
- The Board's representatives noted that it would appear from the site plan

Ormand Flying Club did receive two emails from RWE dated February 14th 2025 and March 19th, 2025 (see below). The subject line in **both** reads RWE Consultation on **Arbourhill, Tipperary WindFarm Proposal.**

From: [REDACTED]
Sent: 14 February 2025 10:48
To: info@ormandflyingclub.ie <info@ormandflyingclub.ie>
Cc: [REDACTED]
Subject: RWE Renewables Ireland Ltd. - Consultation on Arbourhill, Tipperary Wind Farm Proposal

To whom it may concern,

We are writing to you on behalf of RWE Renewables Ireland Ltd. to consult on a wind farm proposal at a site in north County Tipperary. Please find attached information outlining the location and current plans. At this stage we are seeking to identify any potential issues or constraints that we should be aware of as we progress the design of the wind farm and supporting infrastructure.

We would welcome any feedback or information you may wish to share at your earliest convenience.



Best regards,

[REDACTED]

From: [REDACTED]
Date: Wed 19 Mar 2025 at 11:31
Subject: Re: RWE Renewables Ireland Ltd. - Consultation on Arbourhill, Tipperary Wind Farm Proposal
To: info@ormandflyingclub.ie <info@ormandflyingclub.ie>
Cc: [REDACTED]

To whom it may concern,

I am just following up on the below and attached. Please also note that in their response to our email, the IAA suggested direct engagement with yourselves to ensure you were aware of the plans given that you are the nearest aerodrome to the proposed wind farm site.

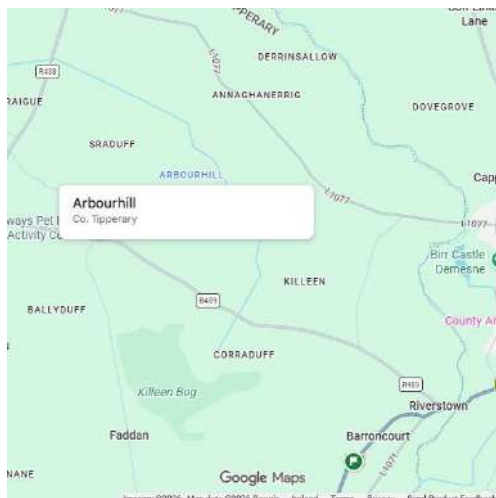
If there is anything you wish to raise as a potential issue, please don't hesitate to get in touch.



Best regards,

[REDACTED]

There are a number of Townlands in Co. Tipperary named Arbourhill (see below) but none have a direct impact on Birr Airfield.



An email exchange between Officers in Ormand Flying Club determined that these locations are a substantial distance from Birr Airfield and deemed it not relevant. No further communication occurred.

A review of Appendix 1-3 Consultee Responses in the RWE Application files includes two separate interactions between RWE and the Irish Aviation Authority. In both the IAA requested that Birr Airfield and Ormand Flying Club be contacted directly about the Ballincor Windfarm proposal. See below:

RE: EIA Scoping for Ballincor Wind Farm

From: Christophe O'BRIEN <Christophe.O[REDACTED]>

Date: Fri 4/5/2024 12:05 PM

To: Ryan O'Toole <[REDACTED]>

Cc: John Dillon <[REDACTED]>

You don't often get email from christophe.o[REDACTED]. [Learn why this is important](#)

CAUTION: This email originated from outside of the organisation. Do not click links, open attachments or scan QR codes unless you recognise the sender and know the content is safe. Forward unusual emails to [REDACTED] for verification.

Good afternoon Ryan,

Thank you for your email and the information provided in relation to the proposed Ballincor WF in Co. Offaly.

Having reviewed the coordinates you have provided, it appears that the proposed site is approximately 5kms South West of the licensed Aerodrome – Birr Airfield in Co. Offaly.

As such, we would request that you engage directly with the Aerodrome licensee as part of your consultation process.

Contact details for Birr Aerodrome are as follows:

<https://ormandflyingclub.ie/>

Birr Airfield,

Birr,

Co.Offaly

Phone: [REDACTED]
[REDACTED]

Should a formal planning application be submitted, the Irish Aviation Authority will likely offer the following ~~general observations~~:

There are 4 critical points to be made here:

1. The explicit direction at different stages of the process from both An Comisiuin Pleanála and the Irish Aviation Authority to engage directly with Ormand Flying Club **must** require RWE to do more than send an email late in the process.
2. The RWE statement in the second meeting that the development is **outside** the Airfields 'zone of influence' is wholly inaccurate as will be shown in Section 4 and reflects the lack of consultation this submission underlines.
3. Any correspondence seen by Officers of the Club relates to **a different windfarm in a different area**. The email:
 - references the **wrong** development site;
 - is not included within the applicant's Consultees documentation, meaning it's content cannot be independently verified;
 - was not followed up by any telephone contact, site visit, or meeting;

- may, in any event, have been directed to a general or outdated email address and never received.
4. **No direct contact** was made. This constitutes a serious and fundamental failure, denying a licensed aviation facility the opportunity to engage meaningfully at the appropriate stage of the planning process.

As a direct result of this failure, Birr Aerodrome was unable to engage at the pre-application or Environmental Impact Assessment stage, was unable to provide operational data that would have informed the assessment and has been unable to participate meaningfully in a process that directly affects the safety of its operations. This submission is accordingly made without the benefit of a technical dialogue with the applicant that should have occurred before this stage.

3. Operations of Birr Aerodrome and Ormand Flying Club

Flight Training

Ormand Flying Club operates as a Designated Training Organisation approved by the Irish Aviation Authority and delivers Private Pilot Licence training to EASA standards. Demand for training has grown to the point that additional flight instructors have been engaged. Training activity includes:

- solo and dual circuit flying, with repeated low-level approaches and departures in the immediate vicinity of the aerodrome;
- local area navigation exercises using known ground features as visual reference points;
- cross-country training flights across the midland region;
- trial and introductory flights, which are frequently a member of the public's first experience of light aircraft.

General Flying and Club Activity

The aerodrome is active on a year-round basis, with daily operations the norm outside the winter months of November, December, and January. Activity includes member recreational flying, visiting aircraft, and cross-country arrivals from other Irish aerodromes. The aerodrome

holds both AVGAS and MOGAS fuel, making it a practical transit stop for general aviation traffic across the Irish midlands.

Expanding Operations — Skydiving Partnership

EIBR has been the base of skydiving operations over the years and in more recent times up until 2016. In early 2026, a partnership agreement has been concluded with a skydiving operator, with operations scheduled to commence in Summer 2026. Parachute operations will introduce a significantly different and more complex dimension to the airspace around the aerodrome. Aircraft will climb to drop altitude and release jumpers who will descend under canopy over an extended area. Any obstacle that reduces the safe drop zone or the ability to plan reliable flight paths to and from altitude may directly compromise this operation.

Economic and Community Value

The airfield generates tangible economic and social benefit for the local area. The Annual Breakfast Fly-In has raised in excess of €15,000 annually for the Birr branch of St Vincent De Paul and draws aircraft from aerodromes across Ireland and UK. Multiple additional fly-in events are held annually. Airshows held at the site attract significant public attendance. The Annual Birr Vintage week Airshow is a staple in the calendar and attracts enormous crowds every year. In addition, the aerodrome hosts visits from school groups and Scouting organisations providing educational access to aviation for young people in the region.

These activities are not incidental. They represent the visible output of a licensed aerodrome that has served its community for over five decades and is actively growing. Any development that degrades the safety or operational capability of Birr Aerodrome affects not just the club but the broader community that engages with it.

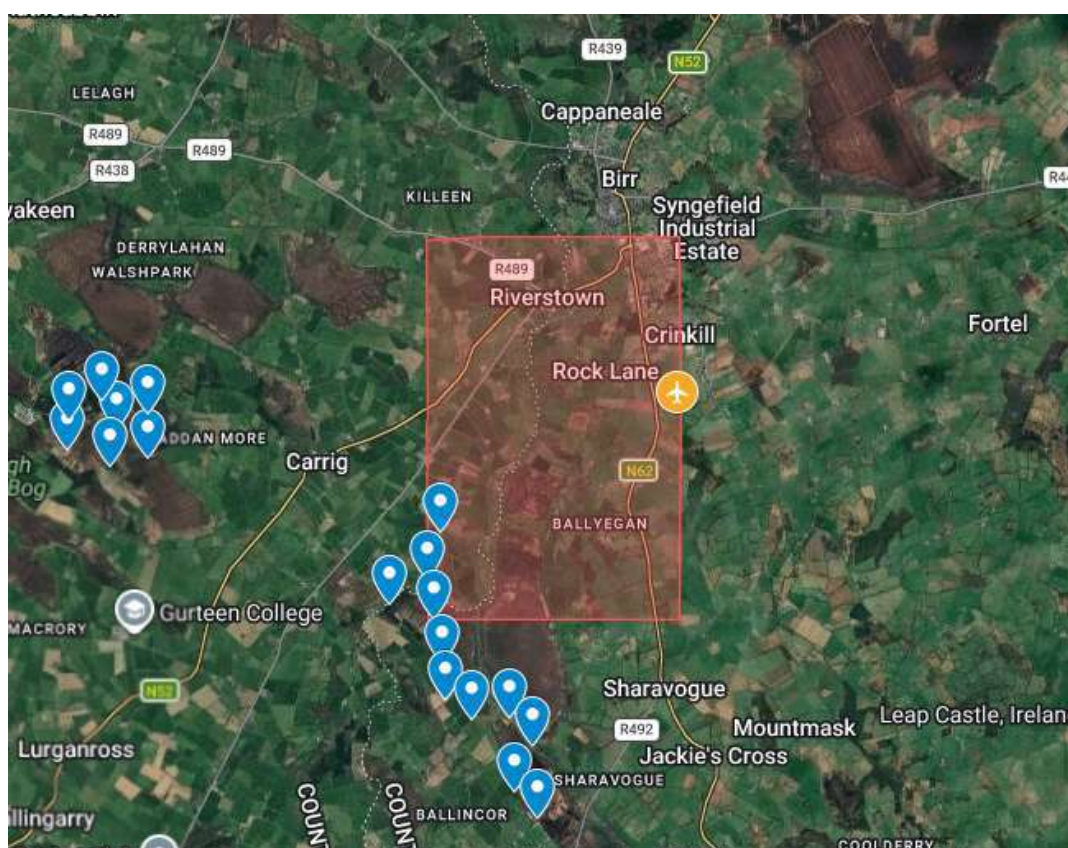
4. Concerns Regarding the Proposed Development

Circuit Flying and Obstacle Clearance

Training circuit flying is conducted at a standard circuit height of 800 feet above ground level around Birr Aerodrome. This is consistent with Irish general aviation practice and is the operationally appropriate height for a runway of this length and type. The standardised rules of the air SERA.5005(f) require aircraft to maintain a minimum clearance of 500 feet above any

obstacle over which they fly. However, 800 feet above ground level is the circuit height, not a height selected with reference to obstacles; it is the standard for safe circuit operations.

Wind turbines of approximately 180 metres tip height — equivalent to approximately 590 feet — would place blade tips at a height that, with the required 500-foot clearance, would demand circuit altitudes in excess of 1,090 feet above ground level in the affected sector. This is not operationally compatible with standard training circuit procedures at Birr Aerodrome. The map below illustrates the aerodrome traffic circuit area utilised for training operations at Birr Aerodrome. Please note the proximity and overlap with the proposed wind farm development - T1 a distance of 3.8km / 2 nautical miles away.



The circuit cannot simply be 'moved'. It is defined by actual wind conditions, the runway orientation, the traffic pattern geometry and the requirement to maintain controlled flight throughout.

Student Pilot Altitude Deviation

A critical and often underappreciated consideration in training environment assessments is the performance envelope of the student pilot, not the qualified one. A student pilot in the early stages of training may deviate from their assigned circuit altitude by plus or minus 200 feet. This

is not negligence; it is the expected variation during the learning process and the reason that 'height-holding' is a core assessed skill. Instructors are trained to manage and correct these deviations.

The consequence of this operational reality is that an aircraft intending to fly at 800 feet above ground level may, at a given moment, be at 600 feet. At that height, in the sector occupied by the proposed turbines, the clearance above a 590-foot tip is a matter of tens of feet. This is not a theoretical risk; it is a foreseeable scenario that arises in the normal course of training operations. The proposed development would introduce a permanent obstacle into airspace where this scenario occurs routinely.

Prevailing Wind and Approach Geometry

Runway 18/36 is aligned north–south. Aircraft take off and land into wind; under prevailing westerly / north-westerly conditions, the active runway and the base and final approach legs of the circuit will be oriented to bring aircraft over or in close proximity to the area in which the proposed turbines are sited. The Ballincor approach sector, identified in the map, is assessed as the more frequently used approach path under typical wind conditions in this part of the midlands.

The implication is that the conflict between circuit traffic and the proposed turbines would not be an occasional or exceptional event. It would be a routine feature of operations under the most common meteorological conditions.

Visual Navigation, Landmark Reliance and Turbulence

General aviation training at uncontrolled aerodromes is fundamentally dependent on VFR rules and visual navigation using clear and recognisable ground features. The River Brosna corridor serves as a **primary visual reference line** for local training flights operating to and from Birr Aerodrome. This is consistent with standard practice at rural training aerodromes, where linear features such as rivers provide unambiguous orientation, positional awareness, and circuit alignment. The introduction of large-scale turbine structures into this corridor would fundamentally alter that visual environment. Turbines of this scale would:

- Compromise the clarity of the river as a navigation reference
- Introduce significant vertical elements that compete visually with the underlying landscape

- Create visual distraction and increase pilot workload, particularly for student pilots still developing situational awareness

In a training context, where pilots are required to maintain aircraft control, monitor altitude, and navigate visually, the introduction of multiple large moving structures (rotating blades) within a primary reference corridor creates a material risk of confusion and misjudgement of position.

In addition the turbines would create a significant physical obstacle hazard and generate mechanical turbulence and wake effects in their lee. Under moderate to strong wind conditions, turbulent wake extending downwind of turbines of approximately 180 metres in height can persist for several rotor diameters — potentially several hundred metres — at altitudes consistent with general aviation training flight.

For a student pilot operating a light training aircraft, the combination of:

- Reduced clarity of visual reference points
- Increased cognitive workload
- Unexpected turbulence in proximity to terrain and obstacles

represents a **serious and unacceptable safety risk** within an established training environment.

Uncontrolled Airspace and the Absence of Radar Separation

Birr Aerodrome operates in class G uncontrolled airspace. There is no radar service and no air traffic control providing separation. Pilots are responsible for their own separation including terrain and obstacle avoidance using visual reference. In controlled airspace, a controller may alert a pilot to a conflicting obstacle or traffic; here, no such safety net exists.

This is precisely why wind turbines in the vicinity of uncontrolled general aviation aerodromes and particularly within the circuit pattern require careful scrutiny. The margin for error is carried entirely by the pilot. Introducing dominant obstacles into routinely used training airspace removes margin that, in a controlled environment, might be recoverable. At an uncontrolled aerodrome, it is not.

Emergency Services and Military Operations

Birr Aerodrome is situated within a designated Military Defence Operating Area. The airfield is referenced in Pooley's flight guide and identified in relevant navigation plates for the midland

region. The aerodrome has served and continues to serve as a base for helicopter emergency and rescue service operations. These activities involve low-level flight by aircraft under operational pressure, often in degraded weather conditions.



Introducing large obstacles into the area used for such operations demands specific and detailed assessment. We are not aware that the implications for helicopter rescue operations or military activity in this area have been adequately considered or addressed in the applicant's submission.

Aviation Lighting, Distraction, and Night Environment

Operations at EIBR take place within day Visual Flight Rules hours — from 30 minutes before sunrise to 30 minutes after sunset. In practice, this means flights regularly occur in the low-sun conditions of early morning and evening, when glare, shadow, and reduced contrast affect a pilot's ability to identify and judge distance to obstacles. Turbines of this height are required to carry aviation warning lighting and in an area currently free of tall structures, the introduction of multiple flashing red obstruction lights alters the visual environment during these marginal daylight periods. The concern is not night operations — the aerodrome does not conduct them — but the degraded visibility at the edges of the operating day when a clear, uncluttered visual horizon matters most. This is an operational consideration that has not been addressed in the applicant's submission.

5. Conclusion

Birr Aerodrome is not a peripheral land use to be noted and set aside. It is a licensed aviation facility, recognised under its ICAO designation, that has operated safely for over five decades, that is actively expanding into skydiving operations in 2026, and that delivers measurable training, economic, and community value to the region. The proposed development cannot be reconciled with the continued safe operation of that facility.

The proposed turbines, at approximately 590 feet tip height, intrude directly into airspace routinely used for training circuits flown at 800 feet above ground level, leaving clearances that — once the normal ± 200 -foot altitude deviation of a student pilot is accounted for — reduce to a matter of tens of feet. That conflict is not exceptional; under the prevailing westerly and north-westerly conditions of the Irish midlands, the affected approach sector is the more frequently used, making the hazard a routine feature of operations rather than an occasional one. These risks are carried entirely by the pilot, in Class G uncontrolled airspace where no radar service and no air traffic control exist to recover the margin for error.

These deficiencies are compounded by a fundamental failure of consultation. The applicant did not make direct contact with a licensed aviation facility lying 3.8 kilometres from the nearest turbine; the correspondence it does rely upon references the wrong development, cannot be independently verified within its own Consultees documentation, and was never followed up. As a direct result, Birr Aerodrome was denied any meaningful opportunity to engage at the pre-application or EIA stage, and the applicant's submission accordingly fails to address — among other matters — the implications for helicopter emergency and rescue operations, for activity within the designated Military Defence Operating Area, for the loss of the River Brosna as a primary visual navigation reference, for turbine wake turbulence at training altitudes, and for the degraded visual environment created by obstruction lighting at the marginal edges of the operating day.

A consultation process that overlooks the very facility most directly affected cannot have produced an assessment capable of properly weighing these risks. On the basis of aviation safety, procedural compliance, and the long-term viability of an established and growing aviation facility, Ormand Flying Club respectfully submits that the application, as presented, is unsafe and unsound, and requests that An Coimisiún Pleanála refuse permission for the proposed development.