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Subject: ACP-323635-25 - Submission on the Observations
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Dear Honor,

Please find attached the Observations on Submissions received by An Coimisiún Pleanála (ACP) for Garrane Green Energy Project (ACP-323635-25) in response to ACP's letter dated 26/11/25 also attached.

Please confirm receipt of this email.

Kind regards,

Sarah Moore

Environmental Team Lea



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GARRANE GREEN ENERGY LIMITED

GARRANE GREEN ENERGY PROJECT AT BALLYNAGOUL, CREGGANE AND GARRANE, CO. LIMERICK

SUBMISSION ON THE OBSERVATIONS ON PLANNING APPLICATION REF: ACP-323635-25

JANUARY 2026



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DOCUMENT APPROVAL

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19 th January 2026		

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PROPOSED GARRANE GREEN ENERGY PROJECT
SUBMISSION ON THE OBSERVATIONS ON PLANNING APPLICATION ACP-323635-25

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1 INTRODUCTION AND BACKGROUND

1.1 Introduction

An Coimisiún Pleanála (ACP) invited Garrane Green Energy Limited (the Developer) in a letter dated 25th November 2025 to make a submission on the Observations by prescribed bodies and third-parties (171 no.) on the proposed Garrane Green Energy Project (ACP-323635-25). This document has been prepared by Jennings O'Donovan and Partners Limited, the Agent, acting on behalf of the Developer. This response has been drafted in ease of the Coimisiún to address the material items raised in the Observations on a thematic basis. All items raised in the Observations have been reviewed and Garrane Green Energy Limited are satisfied that all have been suitably addressed in the EIAR submitted as part of the planning application. However, there are particular items raised in the Observations that this submission will assist in clarifying.

The Structure of this Response Document is set out as follows:

Section 1: Introduction

Section 2: Developer's response to the Observations on the Garrane Green Energy Planning Application with contributions from Biosphere, Eire Ecology, RSK Biocensus, Hydro Environmental Services, Irwin Carr, Macroworks, John Cronin and Associates and Jennings O'Donovan.

Section 3: Conclusion

There are a number of common themes arising from the submissions and are summarised hereunder:

- Shadow Flicker
- Population & Human Health – proximity to houses, health concerns, property value
- Turbine Size
- Inadequate Public Consultation
- Biodiversity
- Ornithology
- Hydrology & Hydrogeology
- Noise
- Landscape and Visual Impact
- Archaeology and Cultural Heritage
- Traffic and Transport

Observations have been addressed in **Section 2**.

1.2 **The Developer**

The Developer – Garrane Green Energy Ltd. is a subsidiary of Greensource Sustainable Developments Limited (Greensource Ltd.).

Greensource is an innovative Irish renewable energy company based in Adare, Co. Limerick that specialises in the development of renewable energy projects, working with communities from pre-planning to operation, and creating long-lasting local partnerships. Greensource has over ten years development and operational experience. Greensource has a highly skilled and experienced team who are committed to developing projects with successful outcomes for all stakeholders. Working with integrity and care for the local environment, the team has a strong track record, having successfully completed wind energy and other renewable projects in Ireland.

1.3 **The Proposal**

Planning permission is sought for a renewable energy development as follows:

- Erection of 9 No. wind turbines with a tip height of 170m. The wind turbine will have a rotor diameter of 150m and a hub height of 95m;
- Upgrade of existing Access Tracks and construction of new permanent Access Tracks, permanent turbine hardstand areas and turbine foundations;
- Construction of two new bridge crossings on-site, one over the River Mague and one over the Charleville Stream;
- Upgrade of existing site drainage network and installation of new site drainage;
- Wind Farm Internal Cabling connecting the wind turbines to the electrical substation;
- Construction of a permanent on-site AIS 110kV Substation, with a 'loop in' Grid Connection to the existing 110kV overhead line between Charleville and Killonan, including two single-storey control buildings with welfare facilities, all associated electrical plant and equipment, security fencing, gates, signage, all associated underground cabling, private well for water supply, wastewater holding tank, and all ancillary structures and works;
- Construction of a permanent double circuit 110kV underground cable and two steel cable interface masts to connect to the existing overhead line;
- Erection of a permanent 60m Meteorological Mast for monitoring wind speeds;
- Construction of a Temporary Construction Compound for use during construction;
- Upgrade of the existing entrance on the N20 (Site Entrance 1) (to be used for abnormal loads and turbine component delivery) and upgrade of an existing site entrance on the

L1537 (Site Entrance 2) (to be used for all construction traffic except for abnormal loads and turbine component delivery);

- 6 No. temporary spoil storage areas and 1 No. permanent spoil storage area;
- Biodiversity enhancement and improvements associated with the Project; and
- Landscaping, fencing and all associated ancillary works.

A 10 year permission and 35 year operational period from the date of the commissioning of the wind farm is being sought.

The EIAR assesses the Project which includes the works within the Redline Boundary as outlined above as well as the temporary accommodation requirements at 6 No. locations along the proposed TDR from Foynes Port. An alternative TDR from the Port of Galway was also assessed for the delivery of turbine blades only, which includes temporary accommodation works at 11 No. locations.

2 **RESPONSE TO OBSERVATIONS**

This section sets out responses to the Observations on the Garrane Green Energy Project planning application.

The Observations include a range of topics, many of which appear in several or all submissions. The responses in this section have been grouped into themes to provide clarity and avoid duplication of information. The principal issues which have been raised appear under common themes and these are summarised as follows:

- Population & Human Health – proximity to houses, health concerns, property value
- Turbine Size
- Inadequate Public Consultation
- Shadow Flicker
- Biodiversity
- Ornithology
- Hydrology & Hydrogeology
- Noise
- Landscape and Visual Impact
- Archaeology and Cultural Heritage
- Traffic & Transportation

2.1 **Population & Human Health – proximity to houses, health concerns, property value,**

2.1.1 **Health Concerns**

A number of submissions raised the issue of health concerns. Submissions on Shadow Flicker and Noise are addressed in Section 2.4, Sections 2.8 and Appendix 4 of this document.

Chapter 5: Population and Human Health of the **EIAR – Sections 5.3.7** and **5.4.6** discusses Human Health. The Department of Health routinely publishes a review of Irish public health indicators derived from several areas, including demographics, population health, hospital and primary care, employment and expenditure. In 2021 it published “*Health in Ireland – Key Trends 2021*” which indicates a generally positive picture of decreasing mortality rates set against high self-perceived health over the past decade. According to this report, Ireland has the highest self-perceived health status in the EU area, with 83.9% of people rating their health as good or very good¹. As stated by the CSO, ‘In 2022, 80% of people in Limerick stated that

¹ The Department of Health (2021) – “*Health in Ireland: Key Trends 2021*” Available at: <https://www.gov.ie/en/publication/350b7-health-in-ireland-key-trends-2021/>

their health was good or very good compared with 86% in 2016. Nationally, 83% of people stated that their health was good/very good².

Electromagnetic fields (“EMF”) are invisible lines of force that surround electrical equipment, power cords, wires that carry electricity and outdoor power lines. Electric and magnetic fields can occur together or separately and are a function of voltage and current.

In 2014 a scientific study was undertaken in Canada³, measuring electromagnetic fields around wind farms and their impact on human health. This study concluded the following:

“There is nothing unique to wind farms with respect to EMF exposure; in fact, magnetic field levels in the vicinity of wind turbines were lower than those produced by many common household electrical devices and were well below any existing regulatory guidelines with respect to human health”.

The EIAR assessed the EMFs as being very localised and are considered to have an **imperceptible, adverse** and **short-term** effect during the construction and decommissioning phases and **imperceptible, adverse** and **long-term** during the operational phase.

2.1.2 Proximity to houses

There are 166 sensitive receptors within a 2km radius of the proposed turbines, comprising one-off houses, clusters of houses and farm holdings as detailed in **Chapter 1 Section 1.4** and **Figure 1.3** of the **EIAR**. The sensitive receptor list was compiled using a desktop study, site visit and community consultation. The list was rechecked monthly prior to the Application being submitted to ensure any proposed developments were captured.

As detailed in **EIAR Chapter 3: Alternatives Considered**, there is a minimum separation distance from turbines (T1, T2, T3 & T9) to inhabited houses of at least 500m for involved landowner and 680m for non-involved houses. Written consent has been obtained in the case where receptors are within 680m of a proposed turbine. The set-back distance from turbines (T4, T5, T6, T7 & T8) located within the floodplain considers the requirement for raised plinths in its calculation. This complies with the draft 2019 WEDGs which recommend a minimum setback distance of four times the tip height from a proposed turbine.

² <https://www.cso.ie/en/csolatestnews/pressreleases/2023pressreleases/pressstatementcensusofpopulation2022-summaryresultsimerick/#:~:text=2022%20and%202016.,Health,compared%20to%2087%25%20in%202016>. [Accessed Online 06/08/2025]

³ Lindsay C McCallum, et al. (2014) *Measuring electromagnetic fields (EMF) around wind turbines in Canada: is there a human health concern?*

2.1.3 Property Value

Property Value is discussed in the **EIAR in Chapter 5: Population and Human Health - Sections 5.3.8 and 5.4.7.**

There is currently one Irish study undertaken to assess the impact of wind farms on property prices.

The study in question which was carried out by Tom Gillespie and Patrick McHale of the University of Galway concludes that, *'This paper investigated the effects of proximity to wind turbines on house prices in counties along the west coast of Ireland using a cross-sectional approach with spatial and temporal fixed effects. I found a significant and robust discount of 14.7% on properties within 1km of a wind turbine. Additionally, I identify significant effects from turbine density, a reduction in value of -2% per turbine within 1km. While effects appear to persist up to 3km, they are not statistically significant.'*

'Furthermore, I present evidence that taller turbines incur a greater discount than shorter turbines. Additionally, I display evidence of heterogeneity in effect dependent on the level of urban influence in the surrounding population. To validate my results, I performed a novel test of robustness using zoning data to demonstrate that there is an insignificant price differential in and around areas zoned for wind development compared to areas that are not zoned. Despite the negative effects induced by wind turbines, my analysis shows that effects attenuate over time, becoming insignificant beyond 10 years post-connection⁴.'

As noted in the paper, the study has several limitations. For instance, the analysis focuses solely on wind development zones in Galway due to data constraints, but expanding it to include all counties would yield more accurate and generalizable results. Additionally, within the 1 km study area, only 255 homes were analysed, limiting the strength of the findings.

A number of studies have been undertaken in the USA and United Kingdom (UK), with findings set out in the **EIAR in Chapter 5: Population and Human Health - Table 5.5.**

Based on the evidence from a number of these published studies, the operation of a wind farm at the Site is considered to not significantly affect property values in the area. The Project will have a **medium-long-term, imperceptible** impact on property values.

⁴ Gillespie T, McHale P (2023) Wind Turbines and House Prices Along the West of Ireland: A Hedonic Pricing Approach, Centre for Economic Research on Inclusivity and Sustainability (CERIS) Working Paper Series, 2023/01. [Accessed 06/08/2025]

2.2 **Turbine Size**

A number of observations raised concerns about the size of the proposed turbine dimensions.

Response

The design and layout of the Project follows the recommendations and industry guidelines set out in the 'Wind Energy Development Guidelines' (Department of the Environment, Heritage and Local Government, 2006), 'Best Practice Guidelines for the Irish Wind Energy Industry' (Irish Wind Energy Association, 2012) and has due regard to the Draft Revised Wind Energy Development Guidelines, December 2019 (Draft Wind Energy Guidelines 2019). The layout and design were an iterative process which followed the constraints-led design approach as detailed in **EIAR Chapter 3: Alternatives Considered**. The selected turbine tip height of 170m is measured from the top of concrete (see **EIAR Chapter 2: Project Description – Table 2.3**). The 170m turbines have been assessed in all chapters and there are no significant effects associated with the selected turbine height.

2.3 **Inadequate Public Consultation**

A number of submissions raised the issue of community awareness and participation, stating that Community consultation has been inadequate.

Response

Chapter 1 Introduction – Section 1.10.1 and **Appendix 1.5 Garrane Community Engagement Report** of the EIAR clearly sets out the numerous rounds and types of public consultation which were undertaken in advance of the submission of the planning application. It is noted that all persons alleging inadequate public consultation are aware of the project and have made submissions in the course of the public consultation.

The Community Engagement Milestones are detailed in the **EIAR in Appendix 1.5** and set out in Table 3.1 below.

Table 3.1: Summary of Community Engagement Milestones 2025 (Ref: EIAR Appendix 1.5 Garrane Community Engagement Report)

Date	Activity
22 April	Project Website Launched
22 April	Letter & Leaflet posted to each household within 2 km of the proposed project
22 April	Calls & emails to all local TD & Councillors
22 April	Advert posted in the Limerick Leader about public consultation
14-15 May	Visits to all households within 1 km of the proposed project
16 July	Community Clinics held in Charleville Park Hotel
August	Letter & Leaflet to residents within 1km advising of the submission of the planning application
Ongoing	Community consultation via phone, email & 1-1 meetings

2.4 Shadow Flicker

There were a small number of submissions on Shadow flicker, stating that it will impact residential amenity and health.

Response

Chapter 14 of the EIAR addresses shadow flicker. The assessment methodology involved the evaluation of potential effects including predicting the shadow flicker effects on the sensitive receptors within the Study Area of the turbine model and comparing them against the Wind Energy Development Guidelines (2006) limits of 30 hours per year and 30 minutes per day. The Project has committed to implement a shadow control system during periods of potential shadow flicker, which, will ensure that negative shadow flicker effects experienced at any sensitive receptor within the Study Area (allowing for a short period of time for the rotor to come to a stop) are mitigated against.

The Developer is committed to installing a shadow control system which means that the turbines' shadow flicker module will be programmed to shut down whenever the conditions for shadow flicker at a property are met, irrespective of which turbine model is installed. Under this approach Garrane Green Energy Project will comply with Wind Energy Development Guidelines (2006) and has due regard to the Draft Revised Wind Energy Development Guidelines (2019). There will be no significant direct or indirect shadow on any receptors from shadow flicker. **Appendix 14.1** of the **EIAR** contains all calculated potential shadow flicker periods for each turbine. The relevant data will be input into the turbine control software. In the event that a complaint or complaints of shadow flicker are received by the Developer / site operator or by Limerick City and County Council, the Developer will conduct an investigation, and the complaints frequency, duration and time of shadow flicker incident will be considered,

and specialist modelling software will be used to confirm the occurrence(s). Should the complaint persist, a shadow flicker survey involving the collection of light data will also be carried out at the receptor in which the complaint was made. Further refinement of the blade shadow control system will be conducted to eliminate the shadow flicker occurrence. This could result in the shutting off, of a turbine or turbines, at specific times of day.

The assessment has identified the potential for shadow flicker to affect 73 no. out of 113 no. receptors within the Shadow Flicker Study Area, as shown in **Table 14.4** of the **EIAR Volume II**. A shadow control system will be installed for the Proposed Project. This assessment has identified that by installing a shadow control system on the proposed turbines, there will be no significant direct or indirect effects. Given that only effects of significant impact or greater, are considered “significant” in terms of the EIA Directive, the potential effects of the Proposed Project as a result of shadow flicker, when mitigated, are considered to be not significant. The Proposed Project has been assessed as having the potential to result in **negative, imperceptible, long-term** effects overall with regards to shadow flicker.

2.5 Biodiversity and Bats

BioSphere has prepared a response to the biodiversity concerns and Eire Ecology has prepared a response to the bat concerns raised in observations relating to the proposed Garrane Green Energy Project and it is attached as **Appendix 1**.

2.6 Ornithology

RSK Biocensus has prepared a response to the ornithological concerns raised in observations relating to the proposed Garrane Green Energy Project and it is attached as **Appendix 2**.

2.7 Hydrology & Hydrogeology

Hydro-Environmental Services (HES) has prepared a response to the hydrological and hydrogeological, including flood risk concerns raised in observations relating to the proposed Garrane Green Energy Project and it is attached as **Appendix 3**.

2.8 Noise

Irwin Carr has prepared a response to the noise concerns raised in observations relating to the proposed Garrane Green Energy Project and it is attached as **Appendix 4**.

2.9 Landscape and Visual Impact

Macro Works has prepared a response to the LVIA concerns raised in observations relating to the proposed Garrane Green Energy Project and it is attached as **Appendix 5**.

2.10 Archaeology and Cultural Heritage

Tony Cummins (John Cronin & Associates) has prepared a response to the Archaeology and Cultural Heritage raised in observations relating to the proposed Garrane Green Energy Project and it is attached as **Appendix 6**.

2.11 Traffic and Transport

Jenning's O'Donovan has prepared a response to the traffic and transport concerns raised in the observations (including those from Limerick City and County Council) relating to the proposed Garrane Green Energy Project and it is attached as **Appendix 7**.

3 CONCLUSION

We respectfully request ACP to have full regard to this response to the observations on the Garrane Green Energy Project planning application. This response has clearly demonstrated that the issues raised in the Observations have been comprehensively addressed in the EIAR, NIS and planning application.

Furthermore, the EIAR and NIS submitted with the planning application clearly demonstrate that the Project will not have a significant negative effect on the environment, nor will it adversely affect the integrity of any European Sites alone or in combination with other plans or projects, in light of their conservation objectives.

The Project will contribute to enabling further renewable energy to be accommodated on the Irish grid, which in the context of the ongoing climate emergency is an urgent Irish national priority that must be given significant weight given the wealth of supporting national and international policy.

Having regard to the energy targets set out in The Climate Action Plan 2025, The Climate Action and Low Carbon Development Act, local and regional planning policy and guidance, it is imperative that renewable energy developments which are in accordance with proper planning and sustainable development, such as the Proposed Project, are given consent.

Having regard to the observations, we respectfully submit that these have all been addressed in the planning application and the EIAR. A series of independent consultants who are competent experts in their respective fields were engaged as part of the EIAR and planning application process.

There has been a significant strengthening and enhancement of Government Policy in the form of the First Revision to the National Planning Framework (NPF) published in April 2025 and at European level, amongst other things, in the form of RED III. This underlines the seriousness of the European Union and Government's commitment to the ongoing climate emergency, which is an urgent Irish national and Union priority that must be given significant weight based on national and international policies.

This Proposed Project will contribute to Ireland's indigenous renewable energy generation, which, in the context of the above, faces significant challenges to its efforts to meet EU and national legally binding targets for renewable energy by 2030, and its commitment to transition to a low carbon economy by 2050. The Irish government has committed to increasing the share of renewables electricity up to 80% by 2030 and targeting 9 GW of onshore wind by 2030. The Proposed Project will sustain and contribute (54 MW) towards Ireland's legally binding targets for reductions in CO₂ and produce energy from native and renewable resources. The proposal will also contribute to the 45% overall renewable energy target by 2030 for the EU introduced by the RePowerEU plan. In this regard, the Proposed Project is a positive development which would accord with the proper planning and sustainable development of the area and would contribute towards meeting the needs of renewable energy generation.

In coming to a decision on this application, we respectfully request An Coimisiún Pleanála to exercise its decision-making function in a matter consistent with:

- a) the most recently approved Climate Action Plan;
- b) the most recently approved national long term Climate Action Strategy;
- c) the most recently approved National Adaptation Framework and approved sectoral adaptation plans;
- d) the furtherance of the National Climate Objective;
- e) the objective of mitigating greenhouse gas emissions and adapting to the effects of climate change in the State (i.e. in accordance with its obligations under Section 15 of the Climate Action and Low Carbon Development Act 2015, as amended);

(together, the "National Climate Policies and Objectives"); and in that context, having regard to the overarching policy requirement to facilitate onshore wind energy development, we respectfully request that ACP grant planning permission for the Proposed Project.

APPENDIX 1:

BIODIVERSITY AND BATS

GARRANE WIND FARM - RESPONSE TO SUBMISSION FOR CHAPTER 6 & AA/NIS

AMENDED DRAFT – 12/01/26

The following are responses to the key Submissions to ACP for issues relating to Chapter 6 of the EIAR and the NIS.

DEPARTMENT OF HOUSING, LOCAL GOVERNMENT AND HERITAGE

Nature Conservation

Appropriate Assessment

“In assessing ecological connectivity with designated sites, the potential for bird movements through the proposed development site between the Charleville Lagoons and the River Shannon and River Fergus Estuaries SPA has been discounted due to the distance between the sites. However, this assessment only takes local bird movements into account; the potential for SCI birds on passage to and from the SPA to use the Charleville Lagoons has not been considered. For example, Shoveler numbers at the Charleville Lagoons (for which species numbers the lagoons are of national importance) peak in October and early spring indicating that there is some use of the lagoons by birds on passage; whereas Shoveler numbers at the Shannon and Fergus Estuaries SPA peak in winter. This aspect of ecological connectivity between the Charleville Lagoons and the Shannon and Fergus Estuaries SPA needs to be explored more fully.”

RESPONSE

A response to the issue raised above is given in the Ornithology Responses (Section 5. Association with designated sites).

Ecological Impact Assessment

Final paragraph of page 12 of submission notes:

“There are two points of concern in relation to the proposal in the Biodiversity Enhancement Management Plan to remove scrub and bramble from the base of hedgerows as part of the hedgerow management plans. Firstly, NPWS are aware of a Badger sett along the eastern boundary of the site, which could be negatively affected by scrub removal. Secondly, the large scale removal of some of the structural complexity of the hedgerows (particularly if they are over mature and have grown sparse at the base) may affect their quality for foraging and commuting bats. Bramble retains much of its foliage into the winter and therefore provides valuable shelter later in the year, when other foliage cover in the hedgerow is sparse. This may be especially relevant if Lesser Horseshoes are using the site in autumn.”

RESPONSE

The above point is presumably made in the context of **Section 2.5 of the Biodiversity Enhancement Management Plan** (Hedgerow re-vitalisation). The sole purpose of this component of the BEMP is

to enhance the structure and species diversity (both flora and fauna) of existing long-established hedgerows, which are now very much overgrown due to the complete absence of recent management (example shown in **Plate 7** of **BEMP**). As described, the work will be carried out over a period of three years and will be co-ordinated and supervised by an ecologist. Cutting will be during winter when flora and fauna (such as insects) are least active.

The focus will be on selectively reducing excessive scrub and bramble growth that has suppressed herbaceous ground flora (such as primrose and lesser celandine) and limited light penetration to the associated wet ditches. However, the work will be carried out in an ecologically sensitive manner and so as not to completely leave bare any sections (so bramble will still be an important component of the ground layer) (full details are presented in the **BEMP, Appendix 6.2 of EIAR**).

The presence of a badger sett along the eastern boundary of the site is noted. While the proposed enhancement programme would not involve any ground disturbance works, the hedging at this badger sett and any others discovered at the time will be either completely avoided or trimmed minimally (best practice approach will be recommended from on-site ecologist). As detailed in the EIAR (**Section 6.9.4**), prior to any works commencing, a pre-construction badger survey of the entire site will have taken place and the status of this sett and any associated subsidiary setts will have been determined.

Regarding bat usage of the site in Autumn and particularly Lesser Horseshoe bats given that bramble will remain a component of the ground layer, preserving foraging and shelter opportunities, the hedgerow itself rejuvenated and the very low usage of the site by this species, this measure will have negligible impact for the species at a local, county or national level. Indeed, the proposed works will increase invertebrate species diversity (as a result of an increase to the diversity of herbaceous species) thus increasing prey availability.

First paragraph of Page 11. of submission. Lesser Horseshoe Bats (Annex II species)

“The Lesser Horseshoe record (October 2022) from the proposed development site is considered highly significant, as no roosts are currently known from this area. The October date of the record may indicate a dispersal movement to a winter roost; however, given the availability of several derelict buildings on site, the presence of a transitional Lesser Horseshoe roost, or a night roost, in the vicinity cannot be ruled out. The time stamp of the record has not been provided; this may have given useful information about the proximity of a roost. Due to the extremely low detectability of the Lesser Horseshoe call on static detectors (sometimes only a few metres), any recorded presence of Lesser Horseshoes is likely to indicate a greater level of activity than the number of records would suggest. “

RESPONSE

Sunset on the 02nd of October 2022 was at 18:58, with the Lesser Horseshoe recorded 3 hours later at 21:59. Lesser horseshoe bats typically emerge 30 minutes after sunset thus this bat was recorded 2 hours and 31 minutes after typical emergence. The recording of a single passing bat at this time is not indicative of a nearby roost. Between 2022 and 2023 the total combined survey time static detectors were deployed on site was over 8,000 hours. Even given the common difficulty of recording Lesser Horseshoe bats, the wide scope of the surveys over these two years would have undoubtedly produced more than a single call if this species was routinely using the site for foraging.

Eire Ecology has previously conducted surveys in northern Mayo, where a single lesser horseshoe bat was recorded on the 12th of October 2022. This record was similarly an anomaly, with the closest previous record of this species being 40km south of the static location. These are vagrant bats

recorded during the period where Lesser Horseshoe bats transition from summer to winter roosts and can stray further afield than their typical range.

Second paragraph of Page 11 of submission. Lesser Horseshoe Bats (Annex II species)

"It is noted that activity surveys of the potential roost structures on site were carried out in summer, which would not necessarily detect an autumn transitional roost. However, it is also noted that during an activity survey at roost structure 2 (the closest such structure to the Lesser Horseshoe record) an unidentified bat was observed which did not trigger the recorder. While this could have been, for example, a Brown Long-eared Bat, which also has a narrow recorder-detectable range, there is the possibility that it was a Lesser Horseshoe."

RESPONSE

Multiple emergence surveys have been conducted at Structure 2 including visual assessments using night vision equipment and bat detectors complying with relevant guidance. No sightings of Lesser Horseshoe bats were recorded. As stated within **Section 4.2.2 of EIAR Appendix 6.1** (the bat report) *"During the daylight search no evidence of bats were noted from any of the structures listed in Table 4-2"*. No structures suitable for roosting Lesser Horseshoe bats are being impacted by the proposed Project. As outlined in Section 2.3 of the Bat Report *"A data search was conducted in April 2023, February 2024 and in May 2025 to revise existing information from the surrounds of the proposed planning boundary"...where known bat roost records within 20km of the proposed project were reviewed. As noted within Section 6 of the Bat report "The site does not lie within a Lesser Horseshoe bat region and the closest historical record for this species [Lesser Horseshoe bat] recorded on the National Biodiversity Data Centre lies 18km to the north-west at Grange and 20km to the north-west towards Rathkeale."*

Any loss of hedgerow, as a connective feature is compensated by the extensive proposed hedgerow rejuvenation, new hedgerow planting and the creation of a woodland. While Lesser Horseshoe typically utilise landscape features for commuting, they prefer feeding in woodlands. As such the proposed Project will lead to a more favourable landscape for this species should the range of this species within extend throughout the lifetime of the Project.

First paragraph of Page 12 of submission. Bat Species

"Since 33 trees with roosting potential (13 of which may need to be removed) have been identified, further information is needed at this stage as to whether these trees are in fact bat roosts (ie established by emergence survey at the appropriate time of year), and whether they will need to be removed (or be otherwise affected), so that the impact of vegetation clearance on bats can be adequately assessed, and so that a Regulation 54 derogation licence can be applied for if necessary in good time. The issue of potential tree roosts has not been adequately addressed in the survey report."

RESPONSE

The figure of 13 trees with roosting potential being impacted by the proposed Project is a misinterpretation of the bat report. 13 trees were categorised as FAR (Further Assessment Required) meaning the surveyor could not determine if the tree had a PRF (potential roost feature) or not. After an examination of the proposed road network, turbine locations and bat buffers; only 1 tree with a potential roost feature is set for removal; tree no 50 located close to T2 will be removed and has a cavity due to branch loss.

Trees No 4 and 5; both pine trees found on the approach to T8 were found to have peeling bark; a potential roost feature for low numbers of bats. Felling of these trees will be avoided. Similarly, trees by the substation site are not going to be impacted, with a route plotted between ash trees that will impact hedge species only. These hedge species have no roosting potential.

Following submission of the planning application, bat survey effort has continued including an assessment of trees with results of the surveys consistent with the findings in the EIAR. These can be made available to An Coimisiún Pleanála at request.

Second paragraph of Page 12. Bat Species

“The proposed carcass search protocol has not been described in detail. It is recommended that a site specific carcass search schedule, and protocol in line with the current NIAE guidelines, is provided.”

RESPONSE

Section 7.4.2.1 of EIAR Appendix 6.1 (the bat report) provided comprehensive details on how post construction monitoring will take place. It stated that the interval of searches should correspond to predation levels (tested using trail cameras but broadly follow Appendix 4 of SNH) and examined search area.

The methodology is robust with 10 years of proposed searches, inclusion of all turbines, has accounted for predation and searcher efficiency trials and requests for raw counts to be adjusted and modelled.

If the NPWS consider that NIEA NED guidance is more appropriate in terms of post construction fatality monitoring, adherence to the latter guidelines could be stipulated by way of planning condition and / or a revised site specific carcass search schedule and protocol can be provided. It should be noted;

- NIEA suggest monitoring should last typically from 3 to 5 years thus substantially less duration than originally proposed.
- The search radius recommended in NIEA is 50m minimum, significantly less than the originally proposed (85m).

Third paragraph of Page 12. Bat Species

“It is proposed as potential further mitigation to increase the buffer area of clearance if high levels of mortality are found. This could have a negative impact on site connectivity for bats, and needs to be assessed in detail at this stage.”

RESPONSE

As detailed in **EIAR Section 6.10.2.2**, should high levels of bat mortality be found, buffer zones surrounding turbines will be increased from 50m to 65m and/or curtailment parameters will be tweaked to increase cut-off times. Increasing buffer zones should be viewed as a last resort in the unlikely event that high levels of mortality are found, as curtailment is the most effective proven mitigation measure for preventing bat fatalities. Curtailment involves turning turbines off when bat activity is high. Eire Ecology have conducted post construction monitoring since 2015 and have surveyed several wind farm sites where curtailment has been introduced. Eire Ecology have yet to find a bat fatality at a turbine where curtailment is operational. If changes are needed, curtailment will be tweaked first prior to removal of hedgerows. The EIAR has fully assessed the maximum buffer of up to 65m from turbine locations and the measures proposed in the BEMP create foraging and commuting corridors away from these locations

AN TAISCE

5. Lacustrine Sediment

“It is noted from the Wetlands Survey Ireland map that part of the subject site is located on lacustrine sediment, whose suitability for turbine installation and access route construction should be clarified as a preliminary matter. This sediment type appears to be linked with the occurrence of a wetland identifiable as ‘Ballynagoul’ (site code: MIW_LI330) which was surveyed during the Limerick Wetlands Field Survey 2025 and contains wet grassland, marsh, river, artificial pond and scrub habitat types. The site evaluation indicates an unknown rating of ecological value, necessitating the need for a further survey to inform a baseline ecological characterisation of the site. It should be ensured by An Coimisiún that this has been conducted adequately by the applicant’s consultants to ascertain the potential for ecological and biodiversity features of value to be contained throughout the site. This would have implications for potential environmental impacts during the construction and operational phases of the development. An Ecological Impact Assessment (EclA) could be requested as further information if the Biodiversity chapter of the EIAR, or the NIS, has neglected consideration of this wetland.”

RESPONSE

Significant site investigation works were undertaken as part of the EIAR, the results of which are included in EIAR Appendices 9.1, 9.2 and 9.3. Soil and subsoils have been fully considered in the **EIAR Chapter 9 Soils & Geology**, this includes the presence of lake (lacustrine) deposits, see **Section 9.3.7 of Chapter 9**.

The above mentioned ‘Ballynagoul’ site appears to have been added to the Wetlands Survey Ireland map in August 2025 following a review of all wetland habitats in County Limerick. This appears to be one of an additional 206 sites within the county which had been identified by field survey or desk review. (see Wetland Surveys press release of 1st August 2025: wetlandsurveys.ie/news/new-wetlands-located-in-county-limerick). The press release notes *“The wetland sites mapped in Limerick are those which have been reported in wide range of published sources, and previously unknown sites located through an aerial photographic analysis combined with sub soils data.”*

For Site Evaluation, the Wetland Surveys mapping tool gives an “F Rating: Unknown value – survey required”, which suggests the site has been identified through a desk-based review comprising an aerial photographic analysis combined with sub soils data.” For Main Wetland Type, the mapping tool notes the following: “Wet grassland, Marsh, River, Artificial Pond, Scrub.”

The habitats listed in the Wetland Surveys Ireland mapping tool concur well with the baseline habitat surveys undertaken for the wind farm project (see **EIAR Section 6.3.3**). In particular, the **Section 6.3.3.2** of EIAR notes the dominance of wet grassland habitat in part of the site, as follows:

*“The sector of the site to the east of the Charleville stream and the Mague River is characterised by low intensity management for cattle grazing. The water table is often close to the surface and much of the area is prone to flooding. Wet grassland and/or Neutral grassland (latter typically associated with low intensity agriculture) dominate throughout and occur in mosaic (see **Plates 6.5 & 6.6**). In very wet areas, **marsh (GM1)** is developing though this only occurs in relatively small patches. Wet grassland also occurs in some of the fields to the north of the River Mague, as well as within the fields where the substation is to be located (see **Plate 6.7**).”*

It is thus clear that the wetland habitat at Ballynagoul, as now listed in the Wetland Surveys Ireland map (though seemingly from a desk-based review), was fully identified as part of the baseline surveys for the Project and its presence was fully assessed within the EIAR.

THE HERITAGE COUNCIL

Biodiversity

RESPONSE

The Heritage Council (HC) submission has reviewed in some detail Chapters 6, 7 and 8 of the EIAR as well as the NIS. While they write (in para. no. 1) "*In a general sense, we believe that the main ecological designations (including those identified in the Natura Impact Statement) have been fully considered, and in broad terms we have no objections to the conclusions*", a number of points are raised which require clarification. The main points raised, which refer largely to the area to the east of the Charleville Stream and Maigue River that has been classified as wet/neutral grassland (GS4/GS1), are addressed in the following:

Paragraphs 3 & 4 of Biodiversity (pg. 2/3) refer mainly to the value ratings given to the mosaic of wet grassland habitats in **Section 6.3.7.1** of **EIAR**. As described in **Section 6.3.3** of **EIAR**, three grassland habitat types (after Fossitt 2000) occur within the site: Improved grassland (GA1), Neutral grassland (GS1) and Wet grassland (GS4). These habitats often occur in mosaic and the dominance of any one type will reflect local management practices. The intrinsic wetness of the soil and the frequency of flooding will also influence the grassland type. As noted in **Section 6.3.3.2** of **EIAR**, the presence of Marsh (GM1) was recorded associated with wet grassland in the very wet areas of the site (i.e. the areas most prone to regular flooding).

Wet grassland dominated by rushes (mostly soft rush *Juncus effusus*) and neutral grassland are widespread habitats in County Limerick as well as throughout much of Ireland and would generally be rated as, at most, Local Importance (lower value) (as stated in **Section 6.3.7.1** of **EIAR**). However, the very wet grassland areas, which in places merge to marsh, were classified as Local Importance (lower-higher value). The areas of 'higher value' would indeed be the wetter areas of grassland and marsh (as suggested in the HC submission), which occur in the area prone to regular river flooding (as shown in **Figure 9.4** of **EIAR**).

By way of clarification, a drawing showing the fields where marsh was recorded as part of the wet grassland / neutral grassland mosaic is presented in the accompanying Figure 1. (this drawing is derived from the baseline information used to compile **Section 6.3.3.2** of the **EIAR** and represents the best estimate by the field surveyor of the distribution of marsh within the wet grassland complex as mapped in **EIAR Figure 6.3**). This area amounts to an estimated 17.86 ha (out of a total of 65.14 ha of wet grassland/neutral grassland mosaic within the site). It is noted that as the marsh element occurs in patches rather than extensive areas it was not feasible to map the marsh areas separately from wet grassland. Also, wet grassland and marsh are botanically fairly similar – in 'Wet grassland' (GS4) Fossitt (2000) writes "*Wet grassland frequently grades into marsh – GM1 and there are many similarities in the range of species present in both habitats*".

Paragraph 5 of Biodiversity (pg. 3) refers to an area of 8.05 ha of neutral and wet grassland to be lost. It is noted that the figure of 8.05 ha (as given in Table 8.21 of EIAR) was a typographical error and the correct figure is 6.04 ha (as given in **Chapter 6** of **EIAR**). Of the 6.04 ha, the amount which will be lost within the fields where elements of marsh occur is estimated at 1.26 ha. As an estimated total of

17.86 ha of habitat with elements of marsh occurs within the site, a rating as a **Slight Adverse** effect is considered appropriate.

It can be confirmed that none of the affected habitat types corresponds with the Annex I habitat 'Molinia meadows'.

Paragraph 6 of Biodiversity (pg. 3) refers to Objective EH O12 of the Limerick County Development Plan 2022-2028 which states that it is an objective of the Council to "*promote connecting corridors for the movement of species and encourage the retention and creation of features of biodiversity value, ecological corridors and networks that connect areas of high conservation value such as woodlands, hedgerows, earth banks, watercourses, wetlands and designated sites*".

It is noted that with the wind farm in place, the majority of the existing habitats on site will still exist and the movement of species through the site will in no way be impeded. For instance, for the neutral/wet grassland habitat complex, only 6.04 ha of the estimated total resource of 65.14 ha within the study site will be required for the proposed Project. Also, the existing network of hedgerows will remain largely in situ and will be enhanced through the Biodiversity Enhancement Management Plan. The watercourses within the site will remain as riparian corridors and species such as otter will be able to move unhindered.

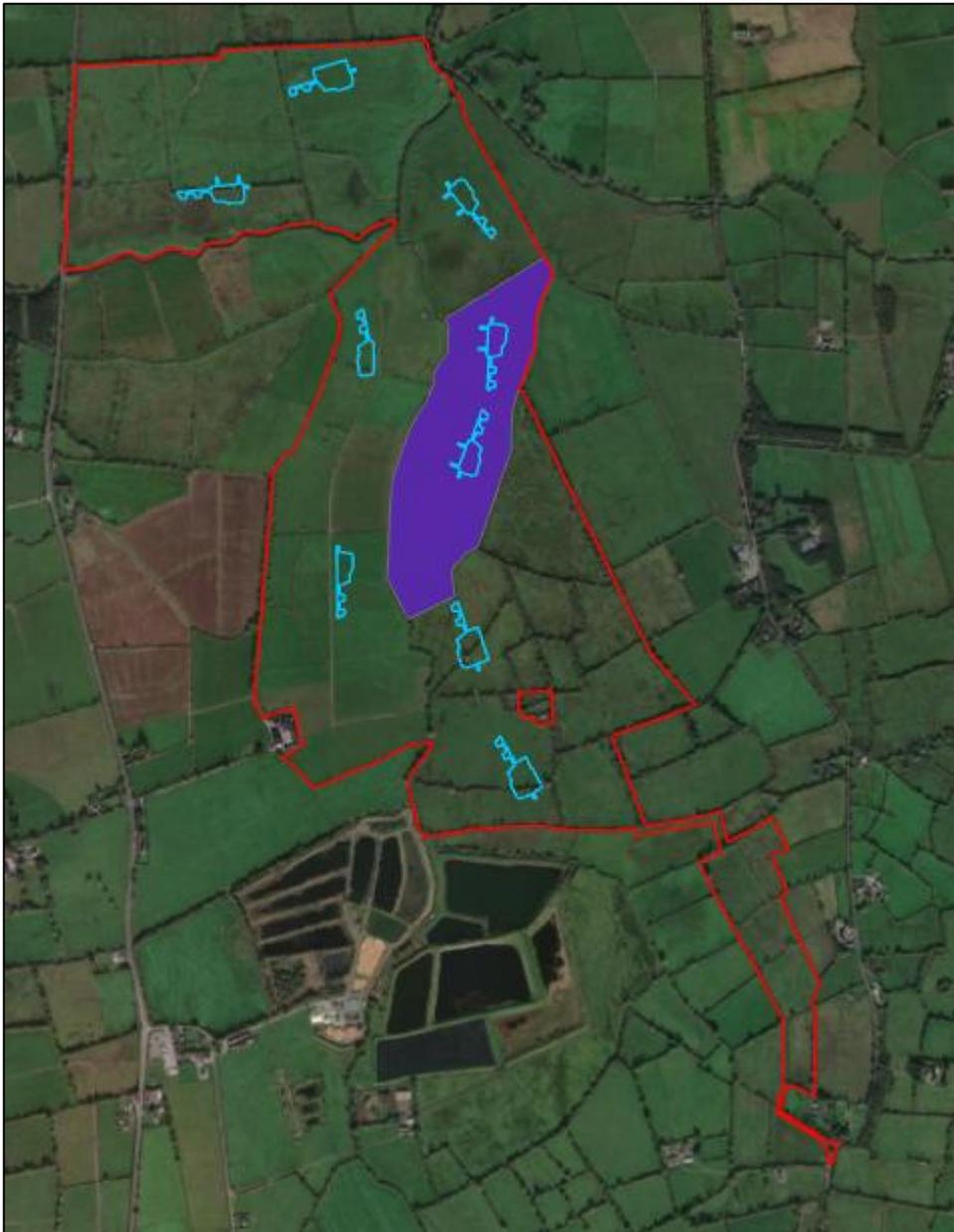


Figure 1. Estimated extent of neutral grassland/wet grassland mosaic (GS1/GS4) which supports elements of marsh habitat (GM1).

MAIGUE RIVERS TRUST

Bullet Point no. 4: Likely spread of invasive species, Giant Hogweed *Heracleum mantegazzianum*

RESPONSE

While the background information given by the Maigue Rivers Trust on Giant Hogweed is correct, we note the following:

- There were no sightings within the study site of Giant Hogweed or any other Third Schedule invasive species during the baseline surveys (see **EIAR Section 6.3.3.7**)
- The commencement of works will be preceded by a confirmatory survey for invasive species, especially Japanese knotweed, giant hogweed and *Gunnera* species (see **EIAR Section 6.5.7**)

- During construction, the best practice measures for the control of invasive species will be implemented (following National Roads Authority - The Management of Noxious Weeds and Non-native Invasive Plant Species on National Roads, NRA 2010).

LIMERICK CITY & COUNTY COUNCIL

The following provide clarifications to various issues raised on Biodiversity and the NIS in the Ecologist's report (by Seán Doyle)

RESPONSE

NIS

“Overall, the NIS conclusions are considered acceptable. The mitigation measures described would be considered generally sufficient. There are some questions that should potentially be clarified by the applicant.

The repost outlines that spoil from trenching not backfilled will be permanently stored behind the substation. The document should outline how this material will be dealt with medium to short term. It should covered o planted to prevent run off in periods of inclement weather.”

The management of spoil on site is detailed in the Spoil Management Plan – Management Plan 4 of the Construction Management Plan (EIAR **Appendix 2.1**). The **Spoil Management Plan – Section 1.6 - Control Measures** details the control that will be implemented on site to prevent sediment run-off. Some of the measure include – regular inspection of spoil areas, silt fencing and once disposal is complete the deposition areas will be re-vegetated with the existing upper vegetated layer removed at the commencement of disposal operations.

“On p30, section 3.1. of the NIS the River Shannon SAC and SPA screened in but p30 says no potential for direct disturbance of habitats or species. There will be works on/near at least 2 rivers with bridges. This has potential to directly impact migratory fish. This may be outside the SAC but they form the SAC population and so direct impacts to an SAC QI species on an ex-situ basis cannot be ruled out. Records from the aquatic chapter of the EIA show that salmon and lamprey species are present in the catchment area. Clarification could be sought here.”

The statement in **Section 3.1** of NIS *“On the basis of geographical separation, there is no potential for direct effects, such as disturbance of habitats and/or species, on these European sites during any of the phases of the proposed Project”* was given in the context of the actual boundaries of the designated sites, i.e. no potential for direct effects from works on habitats/species within the boundaries of the designated sites.

It is accepted that some qualifying Annex II species of the SAC, notably Atlantic salmon and otter (see **Section 3.3** of NIS), occur in the watercourses between the SAC and the wind farm site. However, with the strict mitigation measures proposed to contain water pollution (as detailed in **NIS Section 3.2, EIAR Chapter 10: Hydrology and Hydrogeology** and **Appendix 2.1 Construction and Environmental Plan (CEMP)**), we are confident that there is no significant risk to these species as a result of water pollution associated with any phase of the proposed project and as such there will be no adverse effect on the integrity of the SAC. It is also noted that the two required bridge crossings will utilise clear span bridges and will not involve instream works.

“On p37 the following can be found “While otter was recorded along the Charleville Stream within the proposed Project Site during the baseline surveys (see EIAR Chapter 6: section 6.3.4), it is unlikely

that these animals would commute to the Lower River Shannon SAC due to the channel distance of approximately 25km". Otter territories are known to sometimes span 20Km. Even if this were not the case in this situation, there is likely interaction between SAC population and those found on the site in the form of gene flow and population dynamics. Furthermore, any negative impact on prey species through water quality deterioration may have knock effects downstream closer to or within the SAC. Clarification may be required to enable the complete and accurate assessment of this QI."

We accept that in extreme cases otter territories may extend to up to 20 km of river habitat (probably mainly in low productivity river systems), though in most cases the territories would be far less (as discussed in **Section 3.3 of NIS**). We also accept the concept that in any catchment the otter population is of the same gene pool.

However, as already referred to in the previous point, we are confident that there is no significant risk from water quality deterioration to the prey species of the local otter population due to the stringent suite of mitigation measures (all of which follow current best practice) which will be implemented throughout all phases of the project to protect water quality both within and downstream of the site.

Having regard to the value of the qualifying interests and the negligible magnitude of any residual change in water quality once standard mitigation is implemented, the potential effect on otter and Atlantic salmon is not significant and does not adversely affect site integrity

EIAR

"On P13 of methods the following can be found "Survey for badger was focused on the hedgerows and associated banks within a distance of at least 100m of the wind farm infrastructure. The areas were walked and checked for signs of badger presence, including setts, latrines, snuffle holes, prints, paths and tree scratching". The council received information through submissions made to the council biodiversity officer. The member of the public was directed to the appropriate online platform in which to make their submission. The presence of an active badger sett is reported at the following location 52°23'33.0"N 8°40'05.2"W. This location is within the redline boundary. This reported sett may not be within 100m of windfarm infrastructure and so may have been missed by the survey effort. It would be considered important to verify that no outlier setts or otherwise active setts are present within the known disturbance range before any works would commence."

The presence of the badger sett at the reported location is noted. Its absence from the original baseline survey records (in 2023) is likely to reflect either the subsequent establishment/expansion of the sett (badgers are known to rapidly colonise or re-occupy suitable burrows, including former fox dens) and/or reduced visibility due to encroaching scrub at the time of survey, rather than a methodological deficiency. The baseline survey remains within an acceptable timeframe for EIAR purposes and was completed in line with current guidance.

The sett has now been plotted (Figure 2) and is located approximately 107.59 m from the nearest wind farm infrastructure. An additional hedgerow lies between the sett and the works area, providing visual and acoustic screening. At this distance, with no earthworks proposed in close proximity, the risk of disturbance or tunnel collapse is negligible.

The status of the sett (i.e. main, annex, subsidiary or outlier) will be confirmed as part of pre-construction badger surveys covering all areas where works will occur (see **EIAR Section 6.9.4**).

Should the sett be confirmed as active, standard mitigation will be applied as necessary, including an appropriate stand-off buffer, constraints on heavy plant operations in the vicinity etc.



Figure 2. Location of reported badger sett and distance to wind farm infrastructure.

“On P43 a treeline of probable mature Black poplar hybrid mature is outlined. Black poplar is a native species and is currently scarce in the wild in Ireland. This species provided habitat for a host on animal species should be retained and enhance if possible.”

It is agreed that black poplar is an important tree and provides habitat for a host of animal species. However, the status of the species as a native species in Ireland is somewhat uncertain. Parnell and Curtis (2012)⁵ give the status of *Populus nigra* subsp. *betulifolia* in Ireland as “Probably native in the south and centre though planted in the past in similar situations”, while Nelson and Walsh (1993)⁶ write “It has recently been argued that black poplar is native in Ireland, but the argument is debatable.” The current Irish Tree Explorers Network (<https://www.ucc.ie/en/tree-explorers/trees/a-z/populusnigrasubspbetulifolia>) notes the following: “While native to Britain, Western Germany, and Northern France, its native status in Ireland remains unconfirmed.”

Positive identification of *Populus nigra* subsp. *betulifolia* can be difficult as it is similar in appearance to non-native poplar varieties like *P. nigra* ‘*Italica*’ and the hybrid black poplar *P. x canadensis*.

While the treeline referred to above will be breached to facilitate the new track leading north from the substation (see **EIAR Plate 6.11**), at most one tree may need to be removed (and the treeline also contains a mature crack willow *Salix fragilis* specimen). The main part of the treeline will be left *in-situ* and will adjoin a stand of new planted woodland as part of the native woodland planting programme.

*“On p54 the following can be found “The presence of Irish Stoat *Mustela erminea* is possible but unlikely as the site lacks woodland edge, dry hedgerow bank and stone wall”. It is considered that the site may not contain optimal habitat throughout for stoat but the species is likely present. This species*

⁵ Parnell, J. & Curtis, T. (2012) Webb’s An Irish Flora. 8th edition. Collins University Press.

⁶ Nelson, E.C. & Walsh, W.F. (1993) Trees of Ireland. Lilliput Press, Dublin.

is difficult to observe without targeted trapping efforts. However, it is understood that once small mammal and bird populations do not suffer, unlikely to be any noticeable drop in population."

It is accepted that Irish stoat may well be present on site. However, small mammal species associated with hedgerow banks will be largely unaffected by the proposed project and will continue to have a presence on site during the operational phase. **Section 6.4.5.1** of the **EIAR** notes the following: "*The effect on terrestrial mammal species by the loss of hedgerows is rated as a Slight Adverse effect of Long-term duration. It is noted that hedgerow loss will be off-set by a Biodiversity Enhancement Management Plan, which will result in a net gain of hedgerow and native woodland within the Site.*"

"On P66 of the EIA the following is found "An assessment was conducted only for those species identified as being at high risk of turbine collision, namely Leisler's bat, common, soprano and Nathusius pipistrelle. Full details of the analysis are presented in Appendix 6.2: section 4.5. Collision risk is considered relevant with regards to the potential impacts on bat species. Barotrauma based impacts should also be considered. Furthermore, clarification may be needed on the methods used to analyse bat survey data. Ecobat type analysis, using an online tool that is not operational since November 2022 is questionable. There are readily available and functional analysis tools available."

SNH 2019 and 2021, state that Common Pipistrelle, Soprano Pipistrelle, Leisler's Bat and Nathusius Pipistrelle are species at high risk of collision. These species accounted for 92.6% of bat activity recorded at Garrane proposed Project. Other species found in Ireland typically fly at lower heights thus not at high risk from collision. Eurobats 2015⁸ provided a table of all recorded bat fatalities at European windfarms from 2003 to 2014. When examining Irish bat species on this list, Pipistrelle and Leisler (plus unidentified *Nyctalus* spp) represent 99.42% of finds while *Myotis* species and Brown Long-eared that are present in Ireland represent 0.58%. ⁷ provided a table of all recorded bat fatalities at European windfarms from 2003 to 2014. When examining Irish bat species on this list, Pipistrelle and Leisler (plus unidentified *Nyctalus* spp) represent 99.42% of finds while *Myotis* species and Brown Long-eared that are present in Ireland represent 0.58%.

In an Irish context, Eire Ecology have conducted collision monitoring since 2015. Illien 2022 (unpublished master's dissertation) reviewed data from over 6000 of Eire Ecology's turbine searches at 16 windfarms from 2015 to 2021. Of the identified bats, 93% were either Common, Soprano Pipistrelle or Leisler's bats. No Nathusius Pipistrelle or Lesser Horseshoe bat have been found during searches. Woodland Bats: *Myotis* sp, *Plecotus auritus* and *Rhinolophus hipposideros*, are typically low flying species, usually found at heights below the fatality zone for collision and barotrauma and thus are considered low risk for windfarm fatalities.

Eire Ecology's assessment is based on a robust, transparent, and defensible analytical framework. Rather than relying on the discontinued ECOBAT online tool, we developed an independent dataset using verified historic ECOBAT reference sites from within Ireland. This provides a locally relevant baseline against which activity levels can be meaningfully assessed. Our methodology does not use out-of-date software; it uses a purpose-built analytical process grounded in Irish datasets and refined to ensure a precautionary interpretation of bat activity, particularly for higher-risk species.

Since the submission of the application, a new version of ECOBAT has become available. Eire Ecology has tested this updated tool extensively. Our review indicates that the new ECOBAT version produces inconsistent and potentially misleading outputs: it tends to undervalue activity for common,

⁷EUROBAT (2015). Doc.EUROBATS.AC20.5. 20th Meeting of the Advisory Committee. P.3

high collision risk species, while inflating activity levels for species that are typically under recorded. These distortions result in risk classifications that are substantially less precautionary. In most cases, the new ECOBAT tool would indicate that no curtailment is required, even where local survey evidence suggests otherwise. There are no other similar tools available online at present.

In contrast, Eire Ecology's analytical method applies a more conservative and ecologically responsible approach. By ensuring that activity levels for at risk species are not underestimated, our assessment provides a more reliable basis for collision risk evaluation and ultimately leads to mitigation recommendations that better protect bat populations. We are confident that our methodology is more robust and more precautionary than the currently available automated online tools.

“The total loss of hedgerows is 1,649 m. is reported. The age of the hedgerow for loss should also be considered when applying a biodiversity value to the hedge. Any lost hedgerow should be entirely replanted, All removal should occur outside nesting season. Treelines should be removed between November and February inclusive.”

Whilst the estimated age of the hedgerows is not specifically reported upon in the EIAR, the hedgerows on site are all of significant age with most of the present field boundaries shown on the large-scale Ordnance Survey from previous centuries. The importance of the hedgerows, including their long-established status, was taken into account at project design stage (i.e. minimal hedge and tree removal) and the losses will be offset by new plantings and other measures (as detailed in the BEMP). It is confirmed that removal of hedgerows and trees will be undertaken outside of the peak breeding season (March to August inclusive) (as stated in **EIAR Chapter 8: Ornithology, Section 8.14.3 Timing of Works**).

“There is a concern regarding the turbine/equipment delivery route. Habitat loss through pruning is mentioned but no real detail is provided in total loss of biomass or how many trees will be lost. Will bat roost potential be lost in suitable trees along roadways and is there a need for derogation licences. This may represent a gap in the current application.”

It is not feasible at this stage of the project to identify trees where pruning will be required. However, as detailed in **EIAR Section 6.9.2**, trees and hedges along the TDR pinch points were examined and trees registered as PRF (Potential Roost Features) or FAR (Further Assessment Required) are listed within **EIAR Appendix 6.1** and a Pre-felling survey of trees is proposed. Apart from a section of hedgerow and one tree to be removed at the N20 site entrance (see **EIAR Section 6.4.4.4**), no trees are required to be removed along the TDR.

“On P74 regarding otters the following is found “Otter are primarily nocturnal and are mainly active after dusk and just before dawn. However, animals may be more active by day during cold weather (Hayden & Harrington 2000). Given construction phase works will be undertaken largely in daytime hours (from 07:00 to 19:00 hrs on weekdays). The times provided encompass much of the time described above as optimum otter activity period over much of the year. Perhaps alternative working hours are required when working on bridging points or close to waterways.”

While some disturbance will likely be caused to the daytime activities of the local otter population during the construction phase of the project, it is considered that this will be at the Slight level of importance and will be temporary in duration (see **EIAR Section 6.4.5.3**). Nocturnal otter activity will be largely unaffected.

It is noted that a confirmatory survey for presence of otter within the site will be undertaken prior to the commencement of any works on site (see **EIAR Section 6.5.3**). Particular focus will be on the locations of the two bridging points. Should a holt be located, a restrictive zone will be established where works will be prohibited until breeding activity is complete (following best practice guidance).

“On P77 of the biodiversity chapter, Bruree church roost is noted as a bat roost. This is known to be in fact to roosts in two separate buildings. The roost contains multiple Pipistrelle species, brown long eared and daubentons. This is a well known roost and the misrepresentation of the roost in an EIA chapter may be constructed as a weakness in the report and serve to undermine credibility in the reports as a whole.”

Table 4-3 in the Bat report (**EIAR Appendix 6.1**) details the results of the survey conducted on these buildings, recorded as Location 11. The description states clearly that the surveyor recorded Soprano and Common Pipistrelle bats **emerging from two buildings**. These structures are not recorded in the Bat Conservation Ireland database as roosts. Two ad hoc records, one of Brown Long Eared and another of Daubenton's were submitted to the NBDC Database in 2021 by Susan Kirwan, adjacent to the survey location. These records did not state they were of a roost and were assumed to be ad hoc records. The Core Sustainance Zone (CSZ) for Brown Long-Eared Bat is 3km and 2km for Daubenton's. T7 and T9 are the only turbine locations that fall within the CSZ for Brown Long-eared bat. No hedgerows are proposed to be removed from the surrounds of either of these turbines to retrain connectivity and the hedgerow to the Northeast of T7 is proposed to be enhanced. Both bats are considered low risk for collision with wind turbines, with no impacts to the viability of the roosts expected.

FRIENDS OF THE IRISH ENVIRONMENT

Page 1. Charleville Lagoons and Wildfowl

Charleville Lagoons are nationally important for wildfowl species such as Whooper Swan, Teal and Shoveler. These species are also listed as Special Conservation Interests in nearby SPAs, including Kilcolman Bog SPA and the River Shannon and River Fergus Estuaries SPA. Despite this, the Natura Impact Statement (NIS) barely acknowledges the lagoons, even though they are immediately adjacent to the proposed Project and therefore within the project's potential zone of influence. This omission undermines the validity of the assessment and fails to acknowledge the ecological and legal significance of the site.

RESPONSE

The purpose of the AA screening process is to determine whether the proposed Wind Farm Project at Garrane, either individually or in combination with other plans and projects, is likely to have a significant effect on European sites in view of best and objective scientific knowledge and of those sites' conservation objectives. It is noted that the Charleville Lagoons, while of importance to birds, are not designated as a European site. It is noted further that the detailed baseline ornithological survey data did not identify a regular movement over the wind site of any of the Special Conservation Interests of the two SPAs referred to (whether such originated from Charleville Lagoons or elsewhere) (also, see 'Ornithology Responses' (section 5. Association with designated sites).

Page 2. River Maigue and Aquatic Species

The River Maigue supports Atlantic salmon, river and brook lampreys, white-clawed crayfish, European eel, and otter – all Qualifying Interests of the Lower River Shannon SAC. The Maigue feeds

directly into the SAC and plays an essential role in maintaining its conservation objectives. Consequently, any deterioration in upstream water quality or hydrology would directly compromise the integrity of the SAC. Impacts on these populations upstream would therefore undermine the integrity of the SAC itself, contrary to Article 6(3) of the Habitats Directive. The **Natura Impact Statement (NIS)** states that for the Lower River Shannon SAC (site code: 002165) that "It is concluded that there is ecological and hydrological connectivity between the proposed Project and the SAC (**Table 6.3** page 20).

RESPONSE

On a point of clarity, two of the species mentioned – white-clawed crayfish and European eel, are not qualifying interests of the Lower River Shannon SAC (as stated in submission).

Ecological and hydrological connectivity between the proposed wind farm site and the Lower River Shannon SAC is fully acknowledged in the AA Screening Report, as is the risk of effects on the qualifying species in the absence of appropriate mitigation. For this reason, an NIS has been prepared which will assist An Coimisiún Pleanála in carrying out Appropriate Assessment for this European site. The NIS, and also Chapter 10 of the EIA: Hydrology and Hydrogeology, includes full details of the various mitigation measures which will be implemented throughout all stages of the proposed project to ensure that there are no significant adverse effects on local water quality and on the integrity of the Lower River Shannon SAC.

Page 3. Bats and Foraging Habitat

There was only one recording of a Lesser Horseshoe bat (in October 2022) but the presence of this one record is extraordinary. It is strange that follow-up survey was not carried out to determine whether Lesser Horseshoe bat regularly uses this area as a corridor late in the year (to travel between summer and winter roosts). Lesser Horseshoe bats are an EU Habitats Directive Annex II listed species and are particularly affected by hedgerow removal, which will occur as part of the development. Turbines cause direct mortality through collision and barotraumas, and lighting or habitat fragmentation increases disturbance.

RESPONSE

As stated in the DAU response above, a single recording of a lesser horseshoe bat, 2.5 hours after typical emergence, is not indicative of a roost nearby. This recording represented 0.0007% of total records from statics. No evidence of roosting Lesser Horseshoe bat was found over the numerous emergence surveys conducted at the site. Post submission of the application, emergence surveys have been ongoing, the results of which, align with the findings of the EIA these results available upon request. Surveys on site were comprehensive and met all best practice guidance.

As stated above, even if a Lesser Horseshoe bat roost occurs within the locality, this project will have minimal impacts on the roost viability as long as mitigation measures are implemented. This species is not at collision risk, as they fly low. The proposed project will see hedgerow rejuvenation and planting outweighing the reduction in landscape features from mitigation. Hedgerows were selected to be enhanced on the basis of maintaining the best possible connectivity to the wider area, while guiding commuting bats away from turbines by removing landscape features around them. This will ensure connectivity while reducing the risk of fatality.

No external lighting is proposed to be implemented around turbines with limited external lights present at the substation, which will remain off unless work is being conducted. The colour of these lights will be 2400k thus not attractive to invertebrates, fitted with cowls to ensure light is directed only on built

lands thus not shining on landscape features such as the neighbouring woodland. This project will not create enough light pollution to affect bat populations or disrupt their commuting routes.

Bat mortality due to collisions and barotrauma has been considered in the overall risk assessment, which informs the mitigation measures to be put in place to best reduce impacts on bats. Post-construction monitoring, including static surveys and corpse searches, will ensure the proposed mitigation is effective in reducing bat fatalities.

Page 3: Charleville man-made Lagoons

“The Bat Survey Report fails to mention the Charleville Lagoons, despite their proximity to the site and importance as insect-rich feeding grounds. Freshwater habitats are important for bat species, as a source of drinking water and a food source of emerging insects. Wetlands are key habitats for Daubenton’s, pipistrelle, and Leisler’s bats. Mas et al. (2021) state that ‘key bat habitats, such as wetlands and waterbodies, should be avoided’ when locating wind farms. This directly contradicts the siting of turbines adjacent to Charleville Lagoons. The presence of these water bodies strongly indicates that this is not a suitable site for wind turbines. They have also not done any bat survey in the south-eastern part of the development area, where a large sub-station is to be built”

RESPONSE

The Charleville Lagoons do appear to be good potential bat feeding locations. Surveys were not carried out here as the proposed project will have no impact on this feature. Static surveys conducted within the site, provide ample information to carry out an impact assessment. Static surveys provide objective, continuous data across entire seasons, identifying high-risk species and activity patterns that manual methods cannot capture. This standardized data serves as a critical, evidence-based proxy for collision risk.

Survey of the lagoon location would not provide useful information that would have impacted the risk assessment.

An assessment was conducted of the trees in the southern area for roosting potential; these are the only features suitable for hosting a bat roost in the South of the site. The construction of a building(s) in a green field, will have negligible impacts on bat activity as this habitat is abundant in the local area. Treelines and hedgerows here are being retained and while a pathway is being created through the northern hedgerow, the ash trees located here, which are of the best potential for bats, will be retained.

SUSAN KERWIN, BAT REHABILITATION - Objection on grounds of inadequate bat survey and impacts on bat population.

Page 106: Nathusius Pipistrelle

“Given the lack of reliable baseline data for this species in Ireland, it is not safe to conclude that the proposed windfarm is unlikely to have a significant effect on this species. To date, no roosts of the species have been identified in the Republic, so there is no knowledge of the species’ local roost preference or how many may be in the country. Nathusius’ pipistrelle echolocation calls were repeatedly recorded at nearly every static detector location in the bat survey for Garrane Green Energy. This would indicate that this species used the local area year-round. Nathusius’ pipistrelle is considered to be at high risk of collision with wind turbines. Table 5.1 of the bat reports concluded that the potential risk to this species, with no mitigation applied, is high. Without more accurate national

data, however, it cannot be determined with certainty how this species will be affected by a wind farm where it is present."

RESPONSE

While it is true that data for Nathusius Bats' roosting behaviour and habitat preferences is sparse for Ireland, this species is classified as low-risk species within the site based on actual activity levels. The assessment followed the precautionary approach and added all 40kHz Pipistrelle calls as Nathusius although it is likely the majority of these are Common Pipistrelle. While the overall risk assessment for this species shows that the maximum percentile could have a high risk of collisions on some of the wind turbines on site, these values are calculated from the highest nights of activity only and serves as an upper bound for the worst-case scenario impact possible. Risk of collision must reflect the most likely scenario for impacts by taking into consideration that the median of the data collected on site shows Low to Moderate risk.

In the 10 years and at least 8000 turbine searches that Eire Ecology has been conducting corpse searches using trained dogs, not a single Nathusius Pipistrelle has been found.

Finally, the risk assessment has deemed all turbines high risk for at least one species (Common, Soprano pipistrelle or Leisler's bat), therefore curtailment will be implemented throughout the site. This measure will also provide effective protection to Nathusius Pipistrelle even if activity from this species was to increase over time. Curtailment is the most effective mitigation for at risk bat species from turbine collision.

Page 106: Lesser Horseshoe Bat

"A lesser horseshoe Rhinolophus hipposideros bat call was recorded in October 2022. The author of the report concludes that thus call was from a 'vagrant', recorded as an individual moving between summer and winter roosts. It is highly significant that a call from this species was recorded at this location given that the nearest know lesser horseshow bat roost is located c20Km distant and lesser horseshoe bates are known to not travel far from roosting sites. The bat survey should have concluded, using the precautionary principle, that there is likely to be a lesser horseshoe bat roost within 2.5km of the project site."

RESPONSE

As stated in the response to the NPWS query above, the single recording of a Lesser Horseshoe bat represented one call in 134,979. Detectors were in place for 8,136 hours; the surveys were conducted in accordance with relevant guidelines for such projects. If Lesser Horseshoe Bat were roosting and utilizing the site, it is highly likely they would have been recorded more frequently. The call was recorded 2.5 hours after their typical emergence, thus it cannot be inferred the bat was close to a roost. Notwithstanding, even if a Lesser Horseshoe bat roost occurs within the locality, this development will have minimal impacts on the roost viability when mitigation measures are implemented.

Page 107: Substation Hedgerow and Lighting

"This new woodland is proposed as one of the main mitigation measures. However, it will be of very little use in mitigating habitat loss because it will be planted immediately north east of the windfarm's substation. Substations require a significant amount of artificial light at night and this will deter bats. As the bat report itself says "artificial light creates a barrier to bats so lighting should be avoided where possible." Furthermore, substations emit a lot of noise and it will know that bats are distracted by artificial noise."

RESPONSE

The areas where woodland is proposed, borders existing hedgerows and treelines providing good connective features and the substation will have bat friendly, downward-facing external lighting that will only be in use when staff are present. This will have minimal impacts on the woodland or bats in general. This woodland will act as a good feeding habitat and should be viewed as positive enhancement. It is important to note that bat roosts have been found in the substations of windfarms in Ireland. The substation associated with the 70-Turbine Derrybrien Windfarm in Co. Galway was found to have pipistrelles roosting inside it.

The substation is proposed to be constructed to the southwest of the turbine locations, in the centre of a green field. The construction of the building will require the removal of a low hedgerow on the bank of a drain that passes northwest to southeast across the field; the loss of this linear feature (approx 130m) has been assessed and will be offset by mitigation and enhancement measures. The enhancement work consisting of planting of treelines, hedgerows and woodland will take place as soon as planning is granted, with removal occurring as long as possible after this. Notwithstanding access issues, the removal of hedgerows for turbine buffers will take place immediately prior to the powering of turbines, to give several years for the new hedgerow to mature. In the lifespan of the development, maturity of hedgerows will occur relatively quickly.

Page 108: Potential Bruree Ecological Corridor

“What is more, a recent study of lesser horseshoe connectivity has identified the Bruree area in south Limerick as a key potential corridor of connectivity between roosts in Limerick and Kerry.³ The lesser horseshoe recording in the bat survey for Garrane, which is in Bruree, could therefore be much more significant than the EIAR suggests. More static detection survey, especially in October, needs to be undertaken before any planning decision is made on this project.”

The study cited here: Lenihan, P., Flaherty, M., Finch, D. and McAney, K. 2021, modelling connectivity pathways between Lesser Horseshoe Bat (*Rhinolophus hipposideros* (Bechstein) maternity roosts in Ireland, provides an excellent analysis of potential pathways and routes of connectivity between known Lesser Horseshoe bat maternity roosts within Counties Limerick and Kerry. The study however, has no mention of Bruree and the village is not included on the map of potential least cost routes for these bats (Figure 3 of paper - extract below), actually lying approximately 3.5km outside of the study area of the paper to the south-east.

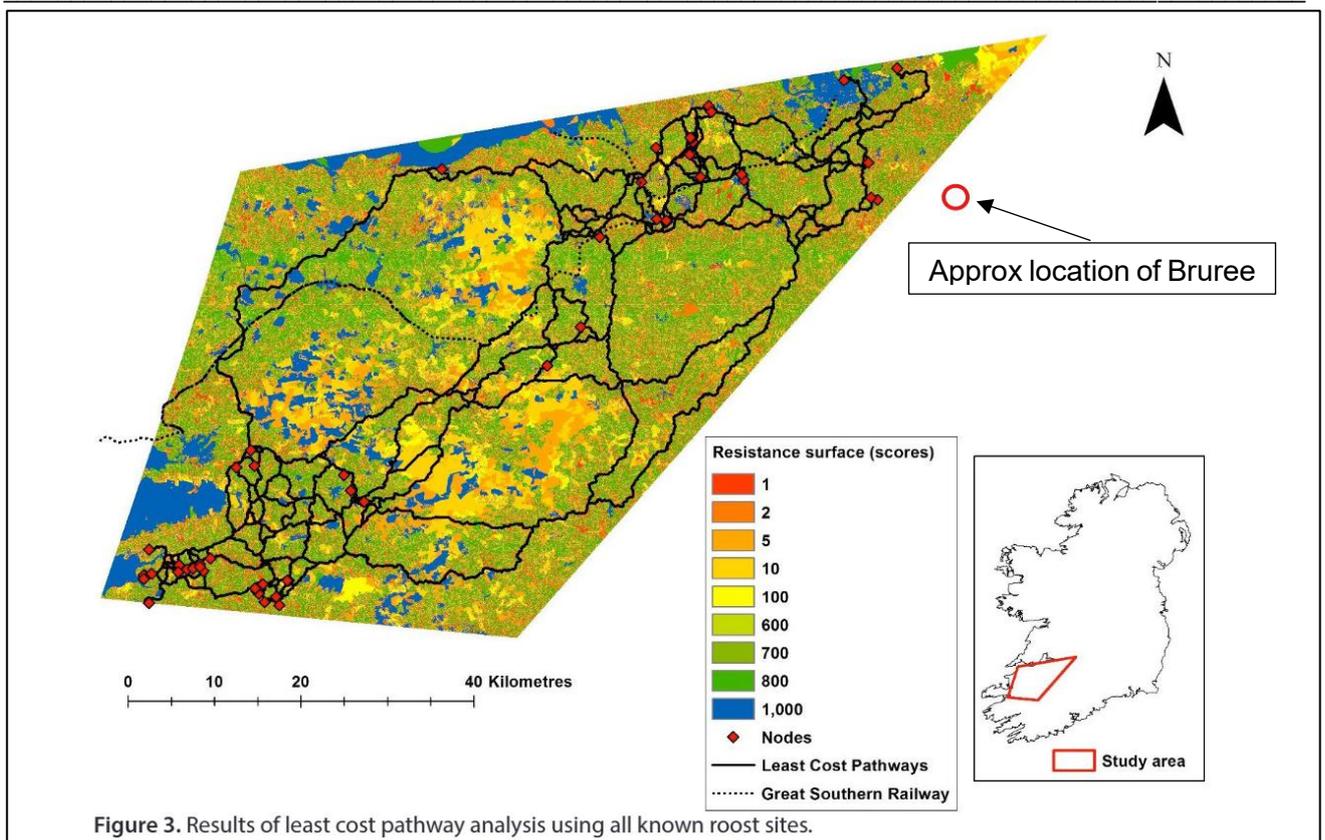


Figure 3. Extract from paper with approx. location of Bruree circled in red.

APPENDIX 2:

ORNITHOLOGY

Garrane Wind Farm Ornithology Responses

These observations in relation to ornithology have been prepared by RSK Biocensus on behalf of Garrane Green Energy Limited (The Developer), in response to a number of responses relating to the submission of planning of the proposed Garrane Green Energy Project.

The responses received primarily related to the following topics:

1. Importance of Charleville Lagoons and survey coverage
2. Assigning importance and impact assessment of ornithological features
3. Collision risk modelling - species selection, nocturnal activity and specifications
4. Barn owl survey effort
5. Designated sites and functional linkage
6. Turbine placement and specifications

Responses in regard to these topics have been discussed below.

1. Importance of Charleville Lagoons and survey coverage

Of most importance to consultees were responses relating to the importance, survey approach, data validity and coverage of Charleville Lagoons. Although no legal underpinning of the lagoons as a designated site for the populations of birds of conservation concern that they support is currently in place (e.g. SPA/Ramsar designation), the importance of Charleville Lagoons is acknowledged in the ornithology EIAR chapter through the data presented and populations identified within the baseline surveys. Some variation was noted in responses to publicly available data collected for the site, which was presented in the report up to ([link here](#)). At the time of writing the EIAR in November 2024, publicly available data on the I-WeBS site summary for Charleville Lagoons was limited to the last completed surveys in 2018/19, since no surveys were undertaken between then and the most recent updated information available at the time in 2021/22. The I-WeBS site was later updated post submission of the EIAR to include data from records acquired in 2022/23 which largely corroborate with existing data from the desk study and field surveys. This data would therefore be of little material difference to the current assessment of species associated with the site within the EIAR as it provides no material difference to the peak number of birds present for Key Ornithological Features assessed. As stated in the EIAR, the desk study included data between 2011-12 within the 10-year site summary available at the time. It was determined that records within the summary provided by I-WeBS was sufficient for informing the determination of regularly occurring bird populations present within Charleville Lagoons. Any records prior to this relate to historic use rather than actively present populations of birds at the lagoons.

As the I-WeBS data provided incomplete recent coverage, additional waterbird surveys at the lagoons were commissioned by the Developer between 2023 and 2024, which provided further context for appropriately assessing the importance of the lagoons and any potential functional linkage with regularly occurring bird populations that may be present within the Proposed Project Site. Although the I-WeBS methodology recommends monthly core counts, an appropriate and proportionate survey approach across typical breeding (April – May), migratory (August – September and March) and non-breeding (December – February) activity periods for waterfowl was undertaken to identify the bird assemblage present within the lagoons across the breeding and non-breeding seasons, with a total of 10 visits each comprising approximately two hours of survey observations. This is considered a sufficient approach for characterising the population of the birds regularly present within the lagoons, and is corroborated by the results across the study period largely aligning with previous I-WeBS data for Charleville Lagoons, as presented in the EIAR.

Additional surveys that were undertaken to further inform the assessment of effects on birds associated with the Charleville Lagoons included VP surveys, which provided high levels of coverage within the entire turbine area and were consistently surveyed across four years. This included coverage over Charleville Lagoons, provided by VP8, for a total of 144 hours (meeting recommended guidance from SNH, now NatureScot) over two years of consistent surveys.

It is our view that the combination of desk study, VP data and waterbird surveys meets recommended guidance and provides sufficient detectability of waterbird species, survey area coverage and is at an appropriate standard for characterising the importance of Charleville Lagoons and any associated birds for assessing the potential for significant effects to any Key Ornithological Features identified of relevance to the Proposed Project.

2. Assigning importance and impact assessment of ornithological features

Several responses were received in relation to the impact assessment approach of certain species, particularly waterfowl potentially associated with Charleville Lagoons and the importance assigned to these species. Such species included, barn owl, hen harrier, shoveler, whooper swan, teal, wigeon etc. Responses have been provided below in regard to the justification of the importance and assessment given to certain species within the ornithology EIAR chapter.

The Site provides limited suitable habitat for shoveler to forage or breed and no observations of shoveler using the terrestrial habitats within the Site were observed during the extensive suite of surveys that were undertaken. Potential displacement/disturbance effects from the habitat within the Site were therefore not anticipated to be significant. Notable populations of shoveler present within the wider study area outside of the Site, at Charleville Lagoons, were referenced within the EIAR. A review by Tolvanen *et al.* 2023 considered the potential for a functional loss of habitat to occur as a result of disturbance/displacement, although the disturbance distances discussed in this paper for waterbird species were highly variable. As no suitable habitat for this species within the lagoons is to be directly impacted by the Proposed Project, limited flight activity for this species was recorded during the extensive suite of VP surveys, and no suitable habitat is present within the Site, shoveler were considered to be of negligible importance in the context of the Proposed Project and significant effects were ruled out.

No regularly occurring notable populations of whooper swan were identified within the zone of influence of the Proposed Project, with habitats dominated by widely available low-quality pasture grassland. Presence of this species throughout the study period was extremely infrequent, limited to one individual foraging within the Site on one occasion, a peak count of two birds at Charleville Lagoons, and flight activity consisting of an individual bird in flight well beyond the turbine area across four years of surveys. Considering the increasing national population of >14,000 birds and regional populations recorded during the [2020 national whooper swan census](#) in Limerick (c. 493) and Cork (c. 488), the infrequently occurring population present within the study area with a peak count of two birds would in theory be of Local level importance if regularly occurring within the Site. However, when considering the level of activity across the four-year study period it was not considered to be a regularly occurring population to the Site within the impact assessment. In accordance with the importance criteria set out in the EIAR methodology, it was determined that the whooper swan population within the zone of influence was unlikely to be of greater than negligible importance in the context of the Proposed Project from the data available across the four-year survey period. Therefore, no significant effects were anticipated from habitat loss, disturbance/displacement or collision risk across any of the development phases.

Other consultee responses also mention the potential for cumulative impacts with other wind farms. Since no significant effects are anticipated from the Proposed Project, any cumulative effects with

other wind farms would also be negligible and not significant. Where any other developments find greater numbers of whooper swan to be present within their zones of influence and predict significant effects, then it is assumed those developments would include a commitment to appropriate mitigation and/or compensation as necessary.

As with whooper swan, similar justifications can be made for the conclusions drawn with regards other waterbirds, where low levels of terrestrial foraging activity and/or flight activity at collision height were observed within the Site area, including for mallard, tufted duck, teal, wigeon and snipe.

Golden plovers were recorded commuting within the Site, flying over in flocks of between 24-46 individuals, but with low levels of foraging activity within the Site. When considering the available habitat in the surrounding environment, embedded/additional mitigation presented in the EIAR, and published national and local non-breeding populations of golden plover, no significant effects on this species were anticipated from habitat loss or displacement. The collision risk modelling for golden plover also demonstrated no significant effects from the Proposed Project, in the context of the local and national populations for this species.

Barn owls were found to be highly infrequent throughout the study area despite being targeted during VP surveys (many undertaken at dawn/dusk), barn owl roost inspections and transect surveys. Given the low levels of activity, this species was not identified as a key ornithological feature for further assessment. Published literature by the [Barn Owl Trust, 2025](#) states that barn owls show a particularly strong tolerance of human-modified environments and linear infrastructure and that evidence indicates they exhibit high levels of habituation to operational wind farms, with no demonstrable long-term displacement effects or collision related effects. In addition, enhancement measures proposed include the provision of nest boxes, which would supplement available nesting opportunities for barn owl beyond the current capabilities of the Site. Combined, these considerations are sufficient for determining no significant effects would occur on barn owls as a result of the Proposed Project.

Similarly, hen harrier was an infrequent visitor to the study area with the majority of flight observations being below collision risk height. The Site is also a significant distance beyond the core foraging range from designated sites which include hen harrier as a species of conservation interest, with no likely connectivity with the breeding populations associated with the Ballyhoura Mountains SAC and IBA. Considering the similar habitat abundance in the wider area, activity within the study area across four survey years being very low and the mitigation proposals, any impacts to hen harriers associated with the Proposed Project would be negligible and not significant.

As for other raptors, although there would be a potential for loss of foraging habitat for kestrel and peregrine, the limited observations of peregrine within the study area across multiple years of surveys indicate that the study area is of low importance to this species. As stated in the ornithology EIAR chapter, it was therefore determined that any loss of habitat, collision related mortality and disturbance/displacement would be negligible for peregrine. For kestrel, displacement from habitat present within the study area is possible, as stated in the ornithology EIAR chapter. However, any such displacement is unlikely to be significant during the construction phase, with the embedded mitigation measures (i.e. best practice construction measures, ecological clerk of works and careful timing of any works) in place. Modelling accounted for the potential risk for kestrel through use of a 95% avoidance rate as recommended by SNH (2016) best practice guidance. As most of the kestrel flight activity was well below potential collision height, the modelling demonstrated that the predicted mortality rate for kestrel would likely be insignificant, with up to 9 birds affected over the 35-year lifespan of the Proposed Project. As discussed in the ornithology EIAR chapter, this estimate would be insignificant in the context of the national and local populations of this species and typical yearly recruitment estimates across 35 years. Nevertheless, bird carcass monitoring would be undertaken

throughout the operational phase, to validate the conclusions of the ornithology assessment and inform any required remedial measures.

3. Collision risk modelling - species selection, nocturnal activity and specifications

Collision risk modelling summarized in the **EIAR Ornithology Chapter** and detailed within **Appendix 8.2** (See Section 3.3) considers multiple factors when selecting species for further assessment. Selection of target species recorded during the VP surveys for detailed collision risk modelling (referred to as 'Key Ornithological Features') was based on the following factors:

- their level of legal protection (e.g., inclusion on Annex 1 of the Birds Directive) and/or conservation concern (e.g., inclusion on the Birds of Conservation Concern in Ireland (BoCCI) Red or Amber Lists (Gilbert et al., 2021));
- their relevance to any nearby designated sites;
- the assessed importance of the Site to the species at an international, national, regional or local level; and
- their level of flight activity recorded with the flight risk volume during VP surveys.

As stated in **EIAR Appendix 8.2**, 11 species were selected for detailed collision risk modelling. This process requires flight activity within the viewshed area at potential collision height to be of a sufficient level (i.e. >4000 flight seconds) to provide an output that could be of material consideration within the impact assessment. Any modelling of species with lower levels of flight activity at potential collision height within the wind farm area would produce only negligible levels of potential collision risk. Concern was given in consultee's responses relating to species associated with Charleville Lagoons. Many of the species with significant flight activity that were listed on the I-WeBS data publicly available ([link here](#)) for Charleville Lagoons are already considered in the modelling, (i.e. black-headed gull, wigeon, lapwing, golden plover, snipe, lesser black-backed gull and cormorant). Species excluded from further modelling included those with only low levels of flight seconds at potential collision height, species that have low conservation status, and/or are of limited importance due to low habitat availability or lack of association with designated sites within the study area. Such species that were excluded due to low flight seconds at collision height within the turbine area included mute swan (382 flight seconds), shoveler (0 flight seconds), gadwall (0 flight seconds) and teal (75 flight seconds). As flight activity is typically directly proportionate to the collision risk estimates, it can be inferred that even under precautionary assumptions the flight activity for these species would equate to negligible collision risk (e.g. <1 bird over 35 years) and so additional modelling would provide no material difference to the impact assessment conclusions provided in the EIAR.

Limitations associated with the feasibility of undertaking nocturnal bird flight activity surveys are a recognised constraint within the collision risk modelling process and was recognised within **Section 8.3.4** of the ornithology EIAR chapter. This limitation has since been addressed within an updated collision risk modelling approach from Band (NatureScot, 2024), which provides a feature within the modelling to include a nocturnal activity factor. This is intended to accommodate any nocturnal bird flight activity that may be underrepresented within the VP survey data set. This modelling is currently ongoing and can be made available to An Coimisiún Pleanála at request. Furthermore, limited habitat of likely significant importance for use by waders, waterfowl or other nocturnal birds is present within the Site. Additional nocturnal surveys were therefore considered unnecessary to inform the baseline conditions.

Responses also noted the turbine specifications used within the modelling. As provided in **Appendix 8.2** of the **EIAR**, the turbine specifications are accurate to those stated in **Chapter 1: Introduction**

and, as recommended in best practice guidance, they represent the overall layout of the proposed wind farm. Any variation due to plinths of less than 2m above existing ground level would be a negligible alteration to the swept range considered in the assessment. It should also be noted that this additional height would make no material difference to the collision risk modelling outputs presented in the EIAR, since bird flight heights were recorded in height bands during the VP surveys, with the upper band extending between 100 m up to 180 m (10 m higher than the upper tip height). This therefore includes data recorded at the heights that would be influenced by the inclusion of the plinths.

4. Barn owl survey effort

Barn owl surveys followed guidance from [BirdWatch Ireland](#) (2021) to identify active nests at suitable sites, and only three of the seven locations identified within the 1 km study area were considered to have been suitable for nesting barn owl. As stated in the guidance, visits must be undertaken at all barn owl breeding locations within a defined survey area (1 km) during the main nesting period (mid-March to mid-July). A visit to all accessible suitable sites identified within 1km of the Proposed Project was undertaken throughout 2023 in the months of April, whereby nesting pairs would likely be actively defending their territory or currently on eggs, in May whereby any nesting pairs would likely be actively on their nests, and again for an additional visit outside of the recommended period in September to coincide with juvenile dispersal and when evidence of breeding success would be present at suitable locations. As no breeding activity was observed within the suitable features identified, it was determined that barn owls would likely be nesting outside of the study area, with limited foraging/commuting activity within the study area. In addition, many of the VP surveys undertaken within the study area were completed at dawn or dusk when barn owls are most active, and only two barn owl sightings were made during the course of the surveys, with no observed flight activity at potential collision height. The results of the surveys and subsequent assessment does not imply that barn owl is an unimportant species but rather that the Site does not support sufficient flight activity at collision height to warrant detailed collision risk modelling in the context of the Proposed Project.

5. Association with designated sites

The association between the study area and a flightline linkage between Charleville Lagoons and Shannon and Fergus Estuaries Special Protection Area (SPA) was dismissed in the impact assessment (**EIAR Chapter 8: Ornithology**) and in the Natura Impact Statement due to the distance between the designated site and the lagoons being greater than 20km, and therefore outside of the core foraging ranges for the qualifying species for which the SPA is of importance (SNH, 2016). Although some birds may migrate from the SPA, it is highly unlikely, given the distance, that those birds would do so on a frequent and regular basis and in sufficiently large/significant numbers for a functional linkage between the estuary and the Site to exist. As described in the NIS, *"It is concluded that the Site is not utilized by any of the SCIs of the SPA"* and conversely no adverse effect on the conservation objectives of the SPA could result from the Proposed Project. This conclusion is supported by the findings of the bird surveys, undertaken over four years, which show many of the species of birds that are included as qualifying features of the Shannon/Fergus Estuaries SPA were typically recorded only in low numbers as detailed in **EIAR Section 8.13** and **EIAR Appendix 8.1**. For example, Shoveler (as referred to in the NPWS observation), It is noted that during the 24 months of baseline activity surveys, only five flightlines of shoveler involved between flocks of two to six birds all below the swept height of the turbines were recorded over the site as detailed in **EIAR Section 8.4.5**.

Furthermore, as the Site does not provide suitable habitat to support on a regular basis any of the SCIs of the SPA, it was concluded that significant effects on the SPA due to the Proposed Project can be ruled out.

6. Turbine placement and specifications

The placement of the turbines would be restricted to the northern aspect of Charleville Lagoons, and no encirclement of the lagoons would result from the Proposed Project. The habitat used by birds that are associated with the lagoons would remain available in its current state and no habitat within the lagoons will be directly or physically removed and/or degraded because of the Proposed Project. Furthermore, collision risk modelling presented within the EIAR followed recognised best practice guidance for assessing collision risk and this hasn't identified any significant effects for the waterbirds that are of particular importance to Charleville Lagoons. It is considered within the assessment that the wide open and predominantly flat landscape provides more than sufficient airspace for migratory birds to continue to reach the lagoons, despite the presence of the proposed wind turbines, with any avoidance measures being insignificant in the context of the typical migration patterns of the relevant species.

A review by Tolvanen *et al.* 2023 identified highly variable displacement distances across a variety of waterbird species. Although a potential of functional loss through displacement of birds from Charleville Lagoons could exist, any potential reduction in usage of the lagoons from displacement would relate to a very small proportion of the habitat in the immediate vicinity of the proposed turbines within the northern aspect of the lagoons. This was considered as part of the ornithology EIAR chapter, where it was concluded that any such effect would be small scale and would not be significant.

Following construction of the Proposed Project, ongoing carcass monitoring would be undertaken to verify the conclusions of the EIAR. This will be in accordance with best practice guidance (SNH, 2018) and will include a commitment to consider relevant remedial measures, should such monitoring demonstrate potential variations to the assessment conclusions. Alongside other measures considered in the Ornithology EIAR chapter, including mitigation and enhancement for addressing the predicted habitat losses within the Site, it is our professional judgement that this would be sufficient for avoiding any potential significant effects within the lagoons and on the bird populations associated with them.

As described in **EIAR Appendix 8.2 CRM Report, Section 3.6**, the collision risk modelling uses a precautionary approach where; "*all birds flying between 20 and 180 m within the WFA have been included within collision risk modelling, despite the proposed turbines for the Project having a maximum height of 170 m.*" Therefore, turbines within the flood zone which will be on elevated plinths have been incorporated into the assessment.

APPENDIX 3:

HYDROLOGY AND HYDROGEOLOGY

Date: 08th January 2026
Our Ref: P1605-1-0010

An Coimisiún Pleanála
64 Marlborough Street,
Dublin 1,
D01 V902.

To whom it may concern,

Re: An Coimisiún Pleanála Appeal Submission

Hydrological and Hydrogeological Responses to Submissions in Relation to the proposed Garrane Green Energy Project, Co. Limerick (ACP-323635-25)

Hydro-Environmental Services (HES) were requested by Jennings O'Donovan (JOD) to respond to the hydrological and hydrogeological concerns raised in submissions relating to the proposed Garrane Green Energy Project.

This response letter responds to the hydrological and hydrogeological issues and concerns raised in the Limerick City & County Council submission, submissions from prescribed bodies and also from 3rd party submissions.

The Proposed Project includes 9 no. proposed turbines, upgrade of existing access tracks and the construction of new access tracks, turbine hardstand areas, turbine foundations, temporary construction compound, construction of 2 no. new bridge crossings on-site, development of a site drainage network, internal cabling, construction of an on-site substation and a 'loop-in' grid connection, erection of a met mast, upgrade of existing site entrances and biodiversity enhancement. A 10-year planning permission and 35-year operational life from the date of commissioning of the entire wind farm is being sought.

1 STATEMENT OF EXPERIENCE – WIND FARM DRAINAGE

Hydro-Environmental Services (HES) has extensive wind farm drainage, flood risk assessment and hydrogeological experience relevant to this project. Wind farm environmental impact assessment in respect of hydrology and hydrogeology and flood risk assessments have and are a core business area for HES presently and over the past 20 years. Wind farm drainage design/management requires experience both as a civil/drainage engineer, a hydrologist, and as a hydrogeological specialist. HES has these combined experiences and expertise. HES has worked on over 100 wind farm projects in Ireland and Northern Ireland. Many of these required assessments of existing drainage features, water quality and flood risk. HES work at all stages of wind farm developments including feasibility stage, layout design & preliminary drainage design/planning stage, FRAs, and also at construction management stage.

HES's experience also covers the key area of water quality and drainage controls and mitigation during the construction phase of wind farm developments. HES work at EIAR/planning stage to assist with the development of the optimal site layout which involves the development of hydrological constraints maps and interaction with geotechnical and ecological specialists and with site designers. HES also provide a follow-on consultancy service (if planning is granted and the development proceeds to construction) of detailed drainage design and construction management for drainage during wind farm development/construction stage. This practical on-site experience is invaluable as it has led to the

development of improved preliminary and detailed drainage layouts and also many improvements/optimisations to standard peatland drainage mitigation measures.

HES specialises in wetland and peatland eco-hydrology. We also complete flood risk assessments for all types of developments across the country.

All these experiences are particularly relevant to this project, and they have been applied through the project development phase, the constraints mapping phase, and EIAR preparation work, including the cumulative impact assessment. This response submission has been prepared by Michael Gill and Conor McGettigan. Michael and Conor prepared the Hydrology and Hydrogeology Chapter of the submitted Environmental Impact Assessment Report (EIAR), and the accompanying appendices including the Stage III Site Specific Flood Risk Assessment (SSFRA) (**Appendix 10.1**) and the WFD Compliance Assessment (**Appendix 10.3**), and their qualifications, competencies, and experience are already presented in the **EIAR (Section 9.1.2)**. David Broderick was also involved in the preparation of the SSFRA and his qualifications and experience are detailed in **Section 1.2** of the **SSFRA**.

2 STATUTORY SUBMISSIONS

2.1 Limerick City & County Council

Limerick City & County Council provided a report which sets out the views of the local authority on the effects of the Project on the environment.

It is noted that in a report dated 4th November 2025, following review of the application documents, that the Council Flood Section (PEMP) raised no objection on the grounds of flood risk.

In relation to hydrology and hydrogeology, the report from Limerick City & County Council concludes that:

“In relation to surface water and flooding, the Planning Authority have reviewed the proposal and recommend conditions in relation to surface water management including that no temporary storage of materials should be stockpiled within Flood Zone A and/or B, development within Flood Zone A and B (such as access roads) should be constructed with flood resilient materials and Proposed access roads should be constructed close to the existing ground levels to ensure that no adverse flow routes or impact to flood storage should occur. It is also advised that any proposed watercourse crossings may be subject to the separate Section 50 process”.

The measures detailed above will be implemented as part of the Project and will ensure that the development does not result in any increase in the downstream and/or upstream flood risk. These mitigation measures were prescribed in the submitted **EIAR (Section 10.6.1.3)** and in the Site-Specific Flood Risk Assessment (**SSFRA – EIAR Appendix 10.1**).

As with all other projects of this nature, any required Section 50 applications will be made post consenting process and pre construction phase.

3 SUBMISSIONS FROM PRESCRIBED BODIES

3.1 An Taisce

In their submission dated 10th October 2025, An Taisce raised concerns in relation to the Water Framework Directive (WFD).

An Taisce note that the Chareville_020 Surface Waterbody (SWB) is designated as moderate water quality status and is considered to be at risk of not achieving good status by 2027.

A comprehensive WFD Compliance Assessment was included as Appendix 10.3 of the submitted EIA. The proposed Project acknowledges the baseline status of local watercourses. The assessment presented in the WFD Compliance Assessment includes the prescription of tried and tested, best practice mitigation measures for the protection of surface water quality and quantity. With the implementation of these mitigation measures, combined with the flood resilience proposals, the Project will have no potential to alter the baseline WFD status or jeopardise the achievement of objectives of any local or downstream SWB, or underlying GWBs.

The WFD Compliance Assessment concluded that with the implementation of the prescribed mitigation measures that the Project:

- will not cause a deterioration in the status of all surface and groundwater bodies assessed.
- will not jeopardise the objectives to achieve 'Good' surface water/groundwater status.
- does not jeopardise the attainment of 'Good' surface water/groundwater chemical status.
- does not jeopardise the attainment of 'Good' surface water/groundwater quantity status.
- does not permanently exclude or compromise the achievement of the objectives of the WFD in other waterbodies within the same river basin district;
- is compliant with the requirements of the Water Framework Directive (2000/60/EC) as amended.
- is consistent with other Community Environmental Legislation including the EIA Directive (2014/52/EU), the Habitats Directive (92/43/EEC) and the Birds Directive (2009/147/EC).

3.2 OFFICE OF PUBLIC WORKS

The OPW note that the Wind Farm Site is located in a drainage district and encapsulates several channels of the Maigue drainage scheme for which the OPW has maintenance responsibilities. The OPW state that they require a 10m wide strip of land running parallel to the main channels and a 5m wide strip of land running parallel to smaller channels to facilitate access and maintenance activities (these requirements were also submitted by the OPW during consultation). As stated in Table 10-8 of the submitted EIA, these requirements have been incorporated into the design of the Project and there will be no works within the 10/5m buffer zones as required by the OPW.

3.3 UISCE ÉIREANN

In their submission dated 29th October 2025 Uisce Éireann note that the proposed Project is located upstream of the Bruree Public Water Supply (PWS) and the Adare PWS.

Robust and comprehensive impact assessments on downstream PWSs were included in the submitted EIA and concluded that the Project has no potential to result in significant effects on any downstream PWS.

Bruree PWS

Section 10.5.2.13 of the **EIA** acknowledges that the whilst the Bruree PWS is sourced from a borehole, the supply is likely to take a significant proportion of its water from the River Maigue. Therefore, a hydrological connection exists between the Wind Farm Site and the Bruree PWS.

However, the assessment concludes that there would be no potential for effects on this PWS, for the following reasons:

- The Wind Farm Site is located outside of the GSI's delineated source protection area for the Bruree PWS which is mapped approximately 2.7km from the closest turbine (T9).
- The length of the hydrological flowpath between Site and the River Maigue adjacent to the supply well is approximately 3.3km.
- The total upstream catchment area of the River Maigue in the vicinity of Bruree is approximately 240km². The Wind Farm Site (1.58km²) represents 0.65% of the catchment area of the River Maigue in the vicinity of the supply to the PWS, therefore significantly limiting the potential for effects.
- This is reinforced by the analysis of surface water flow volumes presented in **Section 10.3.5** of the **EIAR** which states that, based on the EPA hydrotool database, the 95%tile flow volumes (dry weather flows) in the Maigue and Loobagh rivers within the Site are 0.179m³/s and 0.259m³/s respectively. Meanwhile, the 95%tile flow volume in the River Maigue near Bruree is 0.417m³/s. Therefore, the potential for effects decreases significantly downstream of the Site.
- However, the Project does not in any way rely upon the dilution or assimilation capacity of any downstream watercourse. The mitigation measures prescribed in the EIAR and in the WFD Compliance Assessment ensure the protection of all watercourses in the immediate vicinity of the works areas (Charleville Stream, Maigue and Loobagh rivers). By protecting those watercourses located in close proximity to the proposed works areas, all downstream watercourses, including the River Maigue adjacent to the Bruree PWS supply, are protected.
- Detailed, tried and tested, best practice mitigation measures are prescribed in the **EIAR** (**Sections 10.6.2.1** and **10.6.2.2** in relation to suspended solids, **Section 10.6.2.3** in relation to hydrocarbons, **Section 10.6.2.4** in relation to cement-based products and **Section 10.6.2.5** in relation to wastewater) and will ensure the protection of water quality.
- The EIAR also includes mitigation measures for the works proposed at all watercourse crossings within the Wind Farm Site as detailed in **Section 10.6.2.6**.
- By protecting surface water quality in streams/rivers proximal to the proposed works, there is no risk for effects on waterbodies further downstream.
- Therefore, there will be no effects on the downstream Bruree PWS.

Adare PWS

Section 10.5.2.13 of the **EIAR** acknowledges that a direct hydrological connection exists between the Wind Farm Site and the Adare PWS which is located downstream of the Wind Farm Site along the River Maigue. However, the assessment concludes that there would be no potential for effects on this PWS, for the following reasons:

- The length of the hydrological flowpath between Wind Farm Site and the Adare PWS is approximately 16.7km.
- The total upstream catchment area of the River Maigue near Croom, which marks the upstream extent of the Maigue_080 Drinking Water Protected Area (DWPA) is approximately 763km². The Wind Farm Site (1.58km²) represents 0.21% of the catchment area of the River Maigue at the upstream extent of the DWPA. Therefore, the potential for effects is significantly limited.
- However, the Project does not in any way rely upon the dilution or assimilation capacity of any watercourse. The mitigation measures prescribed in the EIAR and in the WFD Compliance Assessment ensure the protection of those watercourses in the immediate vicinity of the works areas (Charleville Stream, Maigue and Loobagh rivers). By protecting those watercourses located in close proximity to the proposed works areas, all downstream watercourses, including the River Maigue adjacent to the Adare PWS, are protected.

- Detailed, tried and tested, best practice mitigation measures are prescribed in the **EIAR** (**Sections 10.6.2.1** and **10.6.2.2** in relation to suspended solids, **Section 10.6.2.3** in relation to hydrocarbons, **Section 10.6.2.4** in relation to cement-based products and **Section 10.6.2.5** in relation to wastewater) and will ensure the protection of water quality in the immediate vicinity and immediately downstream of the work areas.
- The EIAR also includes mitigation measures for the works proposed at all watercourse crossings within the Wind Farm Site as prescribed in **Section 10.6.2.6**.
- By protecting surface water quality in streams/rivers proximal to the proposed works, there is no risk for effects on waterbodies further downstream.
- Therefore, there will be no effects on the downstream Adare PWS.

4 3RD PARTY SUBMISSIONS

This section presents our response to recurring themes included in various non-statutory 3rd party submissions. The following recurring themes were raised in 3rd party submissions:

- Potential increase in flood risk.
- Potential effects on WFD status and objectives.
- Potential effects on the Ballynagoul Geothermal Springs.
- Potential effects on surface water quality.
- Potential effects on designated sites.
- Potential Cumulative Effects.
- Potential effects on local groundwater well supplies.

A notable submission was received from Hydro-G and a response to this submission has been provided separately.

Note that many of the issues raised in the Hydro-G submission are the same as the issues raised by other 3rd parties. The recurring themes which are not raised in the Hydro-G submission are addressed in Section 4.2.

4.1 HYDRO-G SUBMISSION

Hydro-G provided a lengthy submission, on behalf of the Bruree Charleville Effin Wind Farm Action Group in relation to the proposed Garrane Wind Farm development. The submission included several themes relating to hydrology and flood risk, each of which are addressed below.

Inappropriate Site Selection - Flooding

- (a) Hydro-G are of the opinion that the site is inappropriate for development due to the fact that sections of the site are located in Flood Zone A.*

The robust and comprehensive Site-Specific Flood Risk Assessment (SSFRA) and Chapter 10: Hydrology and Hydrogeology of the EIAR do not in any way attempt to play down the risk of fluvial flooding at the site. It is clearly laid out in those documents that the site is subject to flooding, and is located within mapped flood zones.

The design team were well aware of the flood risks throughout all phases of the site selection and design process. **EIAR Chapter 3: Alternatives Considered** details the site selection process, with the site identified in the Limerick Development Plan as a "Preferred Area" for wind energy development. Furthermore, alternative turbine layouts were considered, including an 11 no. wind

turbine development. The Project layout was subject to a constraint-led iterative design process which considered a wide range of environmental constraints, including the flood risks at the site. Finally, the proposed 9 no. turbine layout was chosen as this was considered to reduce the potential for effects on the environment, including hydrology and flood storage, whilst also maximising the potential output of the proposed wind farm. Therefore, alternatives have been adequately considered.

The flood risk at the site has formed an integral part of the Project design. The Wind Farm Site is only deemed to be suitable for the development following the implementation of the bespoke design measures, the flood resilience measures and the conclusions of the quantitative assessments which demonstrate that the Project has no potential to significantly impact flood risk elsewhere (upstream or downstream of the Wind Farm Site). The bespoke design measures and mitigation measures allow the flood risk at the Wind Farm Site to be managed.

Furthermore, the Project is compatible with the wider planning objectives of the area, including the provision of wind energy development at appropriate locations, and the proper planning and development of the area.

It is also noted in the Limerick City & County Council submission report that, following review of the application documents, the Flooding Department raised no concerns in relation to the Project in terms of flood risk.

For completeness the site is considered to be suitable for the Project from a flooding/flood risk perspective for the following reasons:

- The SSFRA has been completed in accordance with 'The Planning System and Flood Risk Management Guidelines for Planning Authorities' (DoEHLG, 2009).
- The SSFRA was also prepared in accordance with the flood risk management policies and objectives detailed in the Limerick Development Plan 2022-2028.
- A robust Justification Test is presented in Section 6.3 of the SSFRA and demonstrates that the requirements of the Justification Test are satisfied.
- It is noted that the site is zoned as a "Preferred Area" for wind energy development in the Limerick Development Plan (2022-2028).
- The site is located outside of the Local Area Plans for Kilmallock and Charleville towns.
- The SSFRA was undertaken at the design stage of the Project. This allowed the SSFRA to inform the siting of turbines and infrastructure within the site, and allowed for the design to be optimised to reduce the potential effects associated with flooding.
- The wind farm design was a constraints led iterative process that considered several physical and environmental constraints, not solely the flooding constraints.
- The final wind farm design was chosen to account for all constraints and was optimised to ensure that the layout has the least effect on flooding, and the least potential for upstream and/or downstream flood effects.
- Although the final wind farm design has several turbines with the modelled flood zones, it is considered that the flood risk at the site can be managed through the implementation of the proposed design measures, the flood resilience proposals, the managed retreat in the event of a flood event during the construction phase.

The design approaches detailed in **Section 5.10 of the SSFRA**, the proposed drainage management at the site during the construction and operation phases of the Project and the flood resilience measures allow for the construction of the Project without any significant effects on flooding.

(b) Hydro-G suggest that the SSFRA does not assess the potential increased risk of flooding posed by the Project to the N20 national road which exists to the west of the site and other upstream receptors.

The suggestion that the potential increased flood risk posed by the Project to local receptors, including the N20 and other upstream receptors, was not assessed is inaccurate.

A robust and comprehensive SSFRA was completed for the Project (Appendix 10-1). The SSFRA includes an assessment of the flood risk both at the Wind Farm Site, and upstream and downstream of the Wind Farm Site. **Section 5.9 of the SSFRA** presents a quantitative assessment of the potential effects of the emplacement of the proposed infrastructure within the flood zones, and the effect that the displaced floodwater volume may have on flood levels within the Wind Farm Site for a range of scenarios. Furthermore, detailed impact assessments were presented in **Section 10.5.3.1 (Potential Effects from the Progressive Replacement of Natural Surfaces with Lower Permeability Surfaces)** and **Section 10.5.3.3 (Potential Effects on Flood Risk)** of the submitted EIAR in relation to potential effects on nearby receptors with regards to flood risk and increased runoff.

The SSFRA included site-specific flood modelling and quantitative assessments which have shown that, with the implementation of the prescribed mitigation measures combined with the Project design measures, that the Project is predicted to have an unmeasurable/imperceptible effect at the Wind Farm Site. Given that the effect on flood levels at the site will be imperceptible, it can be easily deduced that the Project will also have an imperceptible effect on the upstream flood risk.

For completeness the impact on flooding and flood risk elsewhere is deemed to be imperceptible for the following reasons:

- The Project has been designed to reduce the volume of water displacement during flood events. These design measures include:
 - Turbine locations are located outside of watercourse and drain buffers.
 - Proposed spoil storage areas are located outside of mapped flood zones.
 - The layout design is intended to minimise earthworks requirements.
 - Piling of turbine bases is proposed in flood zone areas, and this reduces earthworks volumes at those locations (as piled turbine bases are smaller than standard bases).
 - The proposed design will minimise access roads and hardstands buildups (in flood zones, by keeping them as close to existing ground level as possible) during the construction phase, and will increase to 20-yr flood levels for operational phase.
 - The final operational phase hardstand area at each of the turbines located in the flood zones will be as small as possible.
 - All existing flood zone drainage pathways will be maintained.
 - Bespoke construction phase and operational phase drainage has been designed to maximise water quality protection, and minimize flooding effects.
 - Detailed emergency response procedures have been outlined for potential flood events during the construction phase and during the operational phase.
 - Certain biodiversity enhancement (i.e. hedgerow enhancements) have been designed to avoid mapped flood zones.
 - Critical electrical components at turbines, such as transformers in nacelles, and other sensitive electrical components are proposed above 1,000-yr flood levels.
 - The proposed substation is located in Flood Zone C (i.e. above the 1,000-yr (0.1%AEP) flood level).

- The large area of the floodplain at the Site can absorb any small increase in flood levels as a result of the emplacement of infrastructure within the flood zones.
- The above measures have limited the volume of water with the potential to be displaced to 1,072,629m³ for a 1% flood event and 1,333,641m³ for the 0.1% flood event.
- As detailed in Table I of the SSFRA, these volumes represent a very small portion of the overall flood volume, equating to between 0.53% and 0.89% of the total flood volumes during these flood events.
- This equates to an increase in flood levels of between 4 and 6mm at the Site.
- Whilst the N20 is located immediately to the west of the site, a flood level rise of 4-6mm in this area along the N20 would not result in any significant change from the existing baseline environment and flood levels. There is no potential for significant effects on the N20.
- Therefore, the potential for the Project to result in any increase in the flood risk upstream or downstream of the site is imperceptible.

Contrary to Hydro-G's statement that the construction of the Project adjacent to the N20 would be considered 'maladaptation', the Project has no potential to have significant effects on the N20 or any other receptor located upstream and/or downstream of the Wind Farm Site. The Project will not exacerbate the flooding risk at the N20 or at any other location.

These conclusions of the SSFRA are supported by site-specific flood modelling and quantitative data analysis regarding the volumes of water which may be displaced by the Project during a range of flood scenarios and the resulting rise in flood levels that this will have in the local area.

Omitted Evidence of Flooding

Hydro-G state that the SSFRA underestimates the frequency of past flood events and presents an incomplete picture of past flooding in the local area, and that this under-estimation of the flood frequency supports a conclusion of no confidence in the FRA's claim that the development does not have the potential to significantly increase the upstream or downstream flood risk.

A robust and comprehensive Stage III SSFRA was completed for the Project. This SSFRA included site-specific flood modelling of the site which supersedes all available desk-study information for the site, including any records of historic flood events. The site-specific modelling allowed for the Project to include suitable and conservative flood resilience proposals and design measures to limit the potential effects.

It is acknowledged that the submitted SSFRA does not include all of the historic flood events referred to in the Hydro-G submission. Hydro-G learned of many of these historic events through consultation with a local environmental historian. Furthermore, Hydro-G's suggestion that the SSFRA intentionally misinterprets the flooding recorded on the historic OSI maps of the local area is untrue and unjustifiable. These unintentional omissions occurred in the Flood Risk Identification stage of the FRA, which as per DOEHLG (2009) guidance, is solely used to identify whether there are surface water flooding issues at the site. As stated above, clearly the site is acknowledged to be in mapped flood zones.

The Flood Risk Identification stage of the SSFRA, presented in Section 4.3, drew upon the flood mapping and databases available on www.floodinfo.ie. These databases include the OPW Past Flood Events Mapping, the GSI 2015/2016 Historical Surface Water Flood Mapping, CFRAM mapping, NIFM mapping, CFRAM Mapping for future climate change scenarios, GSI Historical Groundwater flood databases and the GSI's Predictive Flood databases. The Flood Risk Identification stage also reviewed the published soils and subsoils maps of the local area as soils can be a good indicator of

areas which are prone to flooding. Consultation with these databases provided adequate information for the characterisation of flood risk at the site. The Flood Risk Identification stage of the SSFRA concludes in Section 4.3.11 “*that significant portions of the Site are susceptible to fluvial flooding*”. The inclusion of the historic flood events, or other flood databases, referred to in the Hydro-G submission would not have altered the conclusions of this section of the SSFRA which clearly highlights the risk of flooding at the Wind Farm Site.

Furthermore, the record of historic flood events does not form the basis of the detailed flood risk assessment presented in the SSFRA. A review of these data sources simply set the scene for the more detailed flood risk assessment presented in Section 5 of the SSFRA. The same conclusion, that the Wind Farm Site is susceptible to flooding, was reached regardless of whether all recorded historic flood events were referenced in the text of the SSFRA.

Meanwhile, the detailed flood risk assessment was based on site-specific flood modelling which included an assessment of flood flows in the river network at the site, site specific lidar data and GPS surveying data. A total of 19 no. cross-sections of the river channel and floodplain were extracted for the site and design flood flows were modelled for the 20-year, 100-year and 1,000-year flood events.

These modelled flood levels allowed appropriate design levels to be set for the Project infrastructure with access roads and operational turbine hardstands being set at the 20-year flood level in the operational phase, with all sensitive aspects of the project (substation and transformers and electrical components in the turbines) being located above the 1,000-year flood levels. The set levels are very conservative and considered to be best practice in terms of construction in floodplains.

Therefore, the omission of several historic flood events from the flood risk identification stage of the SSFRA does not have any effect on the conclusions of the assessment. The SSFRA acknowledges the flood risk at the site and does not in any way downplay the risk of flooding.

Potential Effects from Soil Compaction during the Construction Phase

Hydro-G state that the EIAR does not assess the potential for soil compaction, and associated loss of porosity and increased runoff rates, due to heaving loading during the construction phase to increase the flood risk.

The purpose of an EIAR is to assess potential likely and significant effects which may result from a proposed Project. The potential for soil compaction to impact runoff rates is not considered to be a significant risk for the following reasons:

- The Teagasc soils map shows that the Wind Farm Site is overlain largely by lacustrine type soils, with alluvial soils in the vicinity of local watercourses and acidic poorly drained mineral soils in the south.
- The GSI subsoils map shows that the Wind Farm Site is underlain predominantly by lacustrine subsoils and mineral alluvium, with some till derived from Devonian sandstones in the south.
- These mapped soils/subsoils are comprised largely of clays and silts, and are of low permeability.
- This is reflected in the GSI mapped groundwater recharge coefficient which is mapped as 8% across the Wind Farm Site.
- The above desk-based information is supported by site-specific information whereby the trial pits excavated on-site encountered slightly gravelly SILT and gravelly silty CLAY. Permeable deposits were only encountered in the base of 2 no. trial pits at depths of 3.4 and 2.7mbgl.
- Therefore, groundwater recharge rates at the Wind Farm Site are currently very low and the vast majority of rainfall becomes surface water runoff.

- Compaction of soil during construction by heavy plant will therefore not result in any significant change to the baseline recharge/runoff rate as the soils and subsoils at the Wind Farm Site are already of low permeability.
- Furthermore, the effects associated with soil compaction would be significantly less than the displacement of floodwaters by infrastructure emplaced in the flood zone which the SSFRA has shown to be an unmeasurable/imperceptible effect (**Section 10.5.3.1** of the submitted EIAR showed that the emplacement of the permanent hardstand area of 88,900m² would result in a 0.24% increase in surface water runoff in comparison to baseline conditions).
- It is reasonable to therefore conclude, based on the above, that the potential for soil compaction to effect the local flood risk is negligible.
- Nevertheless, the project design and mitigation measures including the use of small working areas, the use of piled foundations for turbines within the flood zones (smaller footprint and less ground disturbance) will further limit any potential effects resulting from soil compaction.

Therefore, it is considered due to the local hydrogeological regime, combined with the implementation of the prescribed mitigation measures, that there will be no potential for soil compaction to result in any significant effects on the local environment in terms of flood risk.

Potential Cumulative Effects with Kerry Group WWTP

A robust and comprehensive cumulative impact assessment was presented in **EIAR Chapter 10** and included an assessment of the potential cumulative effects with the Rathgoggan North WwTP and its associated discharge of treated effluent to the River Maigue.

This cumulative assessment is presented in **Section 10.7.4.2** and acknowledges that the wastewater pipeline from the WwTP runs below the site and that it discharges to the River Maigue, just downstream of its confluence with the Loobagh River. Discharge was formerly to the Charleville Stream but has been moved downstream due to the greater assimilation capacity in the Maigue River.

The WwTP plant operates in compliance with an Industrial Emissions (IE) Licence (P0386-04) which sets out strict Emission Limit Values (ELVs). A review of recent Annual Environmental Reports (AERs) indicate that the discharge is compliant with the ELVs and is operating in accordance with its discharge licence. Therefore, the potential for the discharge from the WwTP to have cumulative effects is limited.

Furthermore, with the implementation of the tried and tested, best practice mitigation measures for the protection of surface water quality/quantity during all phases of the Project, as prescribed in the submitted EIAR, there is no potential for significant cumulative effects to occur between the Project and the discharge from the Rathgoggan WwTP.

Section 10.5.2.17 of the EIAR also presents an assessment of the potential effects of the construction phase on the pipeline crossing. Detailed mitigation measures have been prescribed in **Section 10.6.2.17** of the EIAR to ensure that there are no significant effects on the water environment due to the crossing of Project infrastructure over the underground pipeline which carries treated effluent.

The comprehensive assessment presented in the EIAR in relation to the Rathgoggan WwTP and its associated underground pipeline, have demonstrated that with the implementation of the prescribed mitigation measures that there will be no significant effects.

Incomplete Assessment of Risks Posed to Downstream Public Water Supplies

Bruree PWS

In relation to the assessment presented in the EIAR on the Bruree PWS, Hydro-G state that a number of PWSs were impacted in Co. Kerry by “*wind farm failings*” at similar distances to the 3.3km between the Wind Farm Site and the PWS.

Hydro-G fail to mention any specific cases, inhibiting the potential for suitable comparison of these sites to the site of the Proposed Garrane Wind Farm. However, the potential effects associated with “*wind farm failings*” was assessed under the heading of Risk of Major Accidents and Disasters (MADS) (refer to **Section 10.7.5**). The main risk of MADS associated with the Wind Farm Site relates to flooding. As detailed in the EIAR, with the implementation of the proposed drainage measures and the flood resilience proposals the Project will not result in any significant increase in flood risk (any increase in flood levels will be unmeasurable/imperceptible). Furthermore, the main occurrences of “failings” at wind farm sites across the country have related to upland peatland sites where peat slides have resulted in liquefied peat entering local watercourses and having a significant effect on downstream water quality. The topographical and geological setting of these sites is incomparable to that of the Wind Farm Site which is comprised of low-lying agricultural land which is overlain by mineral soils.

Whilst the EIAR does refer to the separation distance between the Wind Farm Site and the PWS, the Project does not rely on this separation distance for the protection of the Bruree PWS. The mitigation measures prescribed in the EIAR are tried and tested, best practice mitigation measures for the protection of surface water quality local to the works. These measures will ensure the protection of the qualitative and quantitative status of watercourses in the immediate vicinity of the proposed works areas and will in turn prevent the any effects on the downstream Bruree PWS.

Adare PWS

Hydro-G state that the details presented in the EIAR regarding the source of the Adare PWS are not current and that the PWS and new sources for the Ryder Cup should have been evaluated.

As part of the data acquisition for the EIAR, HES corresponded with Uisce Éireann in respect of water sources (groundwater and surface water) within 5km of the development. This is considered reasonable, and very conservative, in terms of groundwater sources. The Adare PWS is 17km north of the Site.

Regarding the source of the Adare PWS, **Section 10.3.18** of the **EIAR** states that this is associated with the Maigue_080 DWPA which is located upstream of Adare village. This surface water source has connectivity to the Site along the River Maigue. However, the groundwater source associated with the Adare PWS was not mentioned or assessed due to the distance involved and the indirect pathway via groundwater.

According to the EPA's abstraction database the Adare PWS has two raw water sources, the Maigue River and a groundwater supply. It is noted in an EPA site visit report from July 2024 that the river and borehole (PW03), served 40m³/hr and 26m³/hr respectively. The EPA state that the source borehole (PW03) was drilled in May 2019, became fully commissioned in April 2021 and has a total depth of 140m. The water treatment plant (E147818 N143696) is located in the townland of Derryvinnane, approximately 3km south of Adare town and 170m from the Maigue River. The groundwater source, located at the water treatment plant, is situated ~17km northwest of the Site.

Not assessing (or effectively screening out) of a borehole located ~17km from the Site is valid, as surface waters are considered to be the main sensitive receptors (and pathway) associated with the development due to the local hydrogeological regime which is characterised by high rates of runoff and low rates of groundwater recharge. Given the separation distance there is no potential for effects on the groundwater source and therefore an impact assessment is not required. The potential effects to the Adare PWS, via surface water flowpaths have been assessed in the conservative impact assessment presented in the **EIAR (Section 10.5.2.13)**.

Potential Effects on WFD Status and Risk

The Hydro-G submission raises concerns that the SWBs in the vicinity of the Wind Farm Site are currently failing to achieve their WFD objectives.

A response to concerns surrounding the effects of the Project to impact WFD status and objectives was provided in the response to An Taisce's submission in Section 3.1 above.

To reiterate, **Chapter 10** of the submitted EIAR, and accompanying WFD Compliance Assessment (**Appendix 10.3**), present a robust and detailed assessment which includes the prescription of tried and tested, best practice mitigation measures for the protection of the qualitative and quantitative status of the local SWBs and GWBs. With the implementation of these tried and tested mitigation measures there will be no residual effect on local surface water quality/quantity and therefore there is no potential for the Project to change the WFD status of any SWB or prevent the SWBs from meeting their WFD objectives.

It is noted that the WFD objectives relate to the attainment of Good WFD status by 2027. The local SWBs in the vicinity and downstream of the Wind Farm Site are of Moderate (Charleville Stream_020 and Maigne_030 SWBs) to Good (Loobagh_030 SWB) status (2019-2024). The Charleville Stream_020 and Maigne_030 SWBs are deemed to be "at risk" of failing to meet their WFD objectives of achieving Good status by 2027. Agriculture is listed as a significant pressure on both SWBs whilst urban wastewater is also listed as a significant pressure on the Charleville Stream_020 SWB. These existing pressures are more likely to prevent these SWBs from attaining Good status rather than the construction of a wind farm, over a short period of 16-18 months, with all necessary measures being taken for the protection of water quality.

Therefore, with the implementation of the prescribed mitigation measures, the construction, operation and/or decommissioning of the Project will not result in any other additional pressures which may prevent the future achievement of WFD objectives.

4.2 OTHER 3RD PARTY SUBMISSIONS

Potential Effects on Surface Water Quality

A robust and comprehensive assessment on the potential effects of the Project on downstream surface water quality has been presented in the EIAR and concludes that with the implementation of the prescribed mitigation measures that the pathway between the potential source and local receptors is blocked.

The assessment relies on tried and tested, best practice mitigation measures for the protection of surface water quality. Similar mitigation measures have been used in the successful construction of

several wind farms across the country. The measures ensure that there will be no discharge of untreated or unattenuated water at the site during all phase of the Project. Mitigation measures are also proposed in the EIAR in relation to hydrocarbons, cement-based products, wastewater, piling works and works at watercourse crossings.

Additional site-specific mitigation measures have been prescribed in the EIAR and SSFRA due to the flood risks at the site. These measures include the measures to protect surface water quality in the event of fluvial flooding during the construction phase. These measures include minimising earthworks within the flood zones, the construction of turbines with piled foundations, construction of turbine hardstands within the flood zones as close to ground level as possible, the location of the substation, construction compounds and soil/subsoil storage areas outside of the flood zones. Weather forecasts will be continually monitored during the construction phase, and the forecasting of a red weather warning will trigger a Managed Retreat.

With the implementation of the proposed wind farm drainage system combined with the mitigation measures to protect water quality in the event of a fluvial flood occurring during the construction phase, there is no potential for significant effects on downstream surface water quality.

Potential Effects on Designated Sites

The closest downstream designated site to the wind farm site is the Lower River Shannon SAC. The NIS considered the potential effects on European Sites (Section 3.0) and concluded the Project would not adversely affect the integrity of any European site. A robust and comprehensive impact assessment of the potential effects on the SAC is also presented in the EIAR and the assessment concludes in **Section 10.7.1.14** that there is no potential for significant residual effects on the Lower River Shannon SAC for the following reasons:

- The potential for effects is limited given the distance between the Lower River Shannon SAC and the Site;
- The length of the hydrological flowpath between the site and the SAC is ~25km;
- The SAC is associated with large volumes of saline water which limits the potential for effects as saline waters are less vulnerable than freshwaters;
- However, the Project does not in any way rely upon the separation distance or assimilation capacity of any downstream watercourses;
- The implementation of the tried and tested, best practice mitigation measures prescribed in the EIAR with respect to sediment (**EIAR Sections 10.6.2.1 and 10.6.2.2**), hydrocarbons (**EIAR Section 10.6.2.3**), cement-based products (**EIAR Section 10.6.2.4**) will ensure that runoff from construction areas will be equivalent to baseline conditions and will have no impact on downstream surface water quality;
- Additional mitigation measures are prescribed to ensure the protection of surface water quality in the event of a fluvial flood event during the construction phase (**EIAR Section 10.5.2.12**).
- By protecting water quality in the watercourses in the immediate vicinity of the site, the quality of all downstream watercourses and associated designated sites are also protected.

Submissions also suggest improper screening with respect to several designated sites including the River Blackwater SAC, Kilcolman Bog SPA, Tory Hill SAC, Glen Bog SAC and the Ballyhoura Mountains SAC. All of these designated sites were screened out of the impact assessment and the

NIS (Section 2.4) due to the lack of hydrological and/or hydrogeological connectivity with the Wind Farm Site and/or due to the large separation distance. The hydrological/hydrogeological connectivity, or lack thereof, was clearly outlined in **Section 10.3.17** of the submitted **EIAR**. The screening process was based upon the understanding of the local hydrogeological regime at the site which is characterised by high rates of surface water runoff and low rates of groundwater recharge. This understanding of the site was based upon site investigations, comprising site walkover surveys, drainage mapping and intrusive site investigations. Water at the Site enters the River Maigue and there is no potential to affect any of the abovementioned designated sites.

Potential Effects on Local Private Groundwater Well Supplies

A robust and comprehensive assessment of the potential effects on local groundwater well supplies was included in **Section 10.6.2.8** of the **EIAR**. The conservative impact assessment assumes that all local dwellings have a private groundwater well supply.

For clarity and completeness, there is no potential for effects for the following reasons:

- The Site is underlain by low permeability glacial till subsoils.
- There is no shallow bedrock at the Site.
- Groundwater flowpaths are typically short (30 - 300m maximum).
- Groundwater flows within the Site emerge as springs/baseflow along streams/rivers and leave the Site as surface water flows and not groundwater flows.
- Groundwater flow directions will mimic surface topography and flow towards the Charleville Stream and the River Maigue.
- All local dwellings are located upgradient of the Site.
- Therefore, the potential to effect local wells is very low as groundwater flowpaths between the Projects infrastructure and potential source typically do not exist.
- Nevertheless, mitigation is provided in the EIAR to deal with typical construction phase groundwater hazards such as oils and fuels.
- Therefore, based on our hydrogeological assessment of the Site with regard to groundwater user risk and the proposed mitigation measures, we can robustly say the potential to effect local wells/water supply sources is negligible.

Potential Effects on the Ballynagoul Geothermal Springs

A concern was raised regarding the potential for the Project to impact the Ballynagoul Geothermal Springs. The submission identifies the presence of the springs to the east of the Site in the townland of Ballynagoul, stating that the springs are located ~100m from T1. To clarify, and based on the mapping provided in the O'Gorman submission, the Ballynagoul Geothermal Springs are located ~590m east of T1 and ~300m north-northeast of the proposed substation.

The local field drainage system and watercourses in the area of the Ballynagoul Geothermal Springs are illustrated on Figure 10.3 of the EIAR. Drainage from the springs flows to the west towards the Charleville stream.

It is noted that no springs are identified on the GSI online mapping, or GSI karst database. Furthermore, no springs are identified on the local 6" or 25" basemaps of the area, although some rises are noted, none are given a name. The Ballynagoul Geothermal Springs are not identified as a Geological Heritage site by the GSI, and while they are an important local hydrogeological feature,

they have not been widely studied or documented, other than by the report appended to the O'Gorman submission (Murphy, F. X. and Brück, P. M. (1989))⁸.

Whilst, not assessed specifically within **Chapter 10 : Hydrology and Hydrogeology** of the **EIAR**, the assessment regarding the potential effects on local groundwater well supplies is relevant here. **Section 10.7.1.8** states that there is no potential for significant residual effects on the local private groundwater well supplies. This assessment is relevant as both receptors, the local groundwater well supplies and the Ballynagoul Geothermal Springs, are sourced from groundwater which is not considered to be the primary receptor associated with the Project.

The Ballynagoul Geothermal Springs can be considered to be less susceptible to effects than the local wells as they are associated with deeper groundwater system. Regarding the Ballynagoul Springs, a study entitled "*An Investigation of Low Enthalpy Geothermal Resources in Ireland* (Murphy, F. X. and Brück, P. M. (1989))" found that the primary permeability of the local limestones in the area are low and that recharge area to the springs is believed to lie further south in the Ballyhoura Mountains and is directed towards the local area via major [underground bedrock] faults (*i.e.* groundwater flow to the springs is from south to north towards the Mague River and the wind farm). The referenced study appended to the O'Gorman submission clearly states that the source of the warm water at the Ballynagoul Geothermal Springs is from deep bedrock water arising from regional faulting.

There will be no potential for effects on the Ballynagoul Geothermal Springs for the following reasons:

- The Site is underlain by low permeability glacial till subsoils. The drilling and geophysical surveys completed close to the Ballynagoul Geothermal Springs (Murphy, F. X. and Brück, P. M. (1989)) confirms the presence of deep glacial till also.
- There is no shallow bedrock at the Site, nor at the Ballynagoul Geothermal Springs site.
- Surface water is the dominant flow system at the [wind farm] Site, and within the site shallow groundwater flowpaths are typically short (between 30m to 300m maximum).
- Groundwater flows within the Site likely emerge as springs/baseflow along streams/rivers and leave the Site as surface water flows and not groundwater flows.
- Groundwater flow directions will mimic surface topography and flow towards the Charleville Stream and the River Mague. We know from topography and the surrounding river systems that groundwater flow at the site is to the North.
- The Ballynagoul Geothermal Springs are located ~300m downgradient of the substation, and 590m east of T1. There are several mapped drains between the substation and the Ballynagoul Geothermal Springs, and also between the springs and T1.
- The works associated with the Project are shallow, whilst the Ballynagoul Geothermal Springs are sourced from deep bedrock faults and a deeper groundwater system which flows from the south.
- Therefore, the potential for any element of the Project to effect the geothermal springs does not exist as the source of the spring water does not interact with any area of the proposed Project (*i.e.* there is no interaction with deep groundwater south of the Site).
- Notwithstanding, mitigation is provided in the EIAR to protect general groundwater quality and to deal with typical construction phase groundwater hazards such as oils and fuels. These hazards do not pose any potential to impact on the Ballynagoul Geothermal Springs.

⁷EUROBAT (2015). Doc.EUROBATS.AC20.5. 20th Meeting of the Advisory Committee. P.3

hermal Resources with the aid of Exploratory Boreholes. Final Report for contract No. EN3G-00660-IRL (GDF), Report No. 89/13, Dept. of Geology, UCC, pp. 150.

- Additional mitigation is also provided with respect to potential effects on groundwater due to the use of piled foundations. Piled foundations below turbines to the east and north of the springs do not pose any potential to impact on the Ballynagoul Geothermal Springs as they will not interact with the source water for the Springs.

Therefore, based on our assessment of available data, and considering the proposed mitigation for groundwater protection, we consider that the residual effect on the Ballynagoul Geothermal Springs to be neutral and unlikely.

Potential Cumulative Effects

A detailed assessment of the potential cumulative effects on the water environment was presented in **Section 10.7.4** of the **EIAR**. The cumulative assessment concluded that with the implementation of the mitigation measures detailed in the EIAR, that there will be no significant effects.

Several submissions reference the Ballinlee Wind Farm. However, this wind farm was not included in the hydrological and hydrogeological cumulative impact assessment as it does not lie within the delineated hydrological and hydrogeological cumulative study area which was shown in EIAR Figure 10.11. The hydrological and hydrogeological cumulative study area was defined based on professional judgement, river flows⁹, and natural hydrological and hydrogeological boundaries. There is no potential for cumulative effects to occur between the Project and any development located outside of the delineated hydrological and hydrogeological cumulative study area.

5 SUBMISSION SUMMARY

In summary and in response to statutory and 3rd Party observations relating to the hydrological and hydrogeological environment:

- HES completed a robust, detailed and comprehensive hydrological and hydrogeological impact assessment, WFD Compliance Assessment, a detailed Stage 3 Site-Specific Flood Risk Assessment (SSFRA), and cumulative hydrological impact assessment for the Project which concluded that there will be no significant effects on the hydrological/hydrogeological environment;
- The impact assessments were underpinned by desk based data and site-specific data as outlined in the EIAR;
- HES has responded to all concerns raised by Statutory Bodies, and also concerns raised in 3rd party submissions;
- Concerns regarding the flood risk at the site have been comprehensively addressed. The SSFRA acknowledges the flood risk at the site and the Project design and the flood resilience proposals, significantly limit the potential effects of flooding. Quantitative assessments have shown that there is no potential for significant effects due to the

⁹ As noted on Figure 10-11 and in Section 10.7.4 of the EIAR: the Cumulative Hydrological Study Area is based on flow volumes obtained from the EPA Hydrotool Node 24_188 downstream of the site on the River Maigue. There will be no potential for cumulative effects beyond this cumulative study area due to increases in flow volumes (as the catchment area increases) and increasing distance from the Project.

displacement of floodwaters by infrastructure within the flood zones. The effects on upstream and/or downstream flood levels will be unmeasurable/imperceptible.

- The issues raised in relation to the protection of surface water quality, downstream designated sites, WFD status and potential cumulative effects have been addressed. The prescribed mitigation measures in relation to suspended solids, hydrocarbons, cement-based products and wastewater are tried and tested, best practice mitigation measures which have been applied successfully at many recently constructed wind farms. These mitigation measures will ensure that there are no effects on water quality, downstream designated sites, WFD status and that there is no potential for cumulative effects;
- Concerns regarding the potential effects on local private groundwater well supplies, and the Ballynagoul Geothermal Springs, have been comprehensively addressed. There is no potential for effects due to the hydrogeological setting of the Wind Farm Site, the separation distances between the proposed works areas and local receptors and the implementation of the prescribed mitigation measures for the protection of groundwater quality;
- The concerns raised in relation to the Bruree PWS and the Adare PWS have been comprehensively addressed. The prescribed mitigation measures will ensure the protection of surface water quality/quantity in the immediate vicinity of the works areas and will ensure that there is no deterioration in water quality in the River Maigue downstream of the site. Therefore, there is no potential to impact downstream surface water abstractions. Regarding the groundwater abstraction associated with the Adare PWS, there is no potential for effects given the separation distance between the source borehole and the Wind Farm Site (~17km), and the local hydrogeological regime at the site which is characterised by low rates of groundwater recharge.

We respectfully submit to the Commission that this letter response reiterates the conclusions of the robust and comprehensive impact assessments presented in **EIAR Chapter 10: Hydrology and Hydrogeology**, the associated Stage 3 Site Specific Flood Risk Assessment (**Appendix 10-1**) and WFD Compliance Assessment Report (**Appendix 10-3**). The impact assessments presented in the EIAR rely upon the tried and tested, best practice mitigation measures which ensure the protection of the receiving environment. Similar mitigation measures have been successfully applied during the construction of countless wind farm developments across the country and were also presented in the EIARs for several recently permitted wind farm developments. Therefore, the mitigation measures prescribed in the EIAR for the Proposed Project are suitable and will ensure that there are no significant effects on the receiving environment. The Project has also been designed cognisant of the flood risks at the site and appropriate flood resilience proposals and design measures have been proposed to ensure that there are no significant effects from flooding.

As a result of the above, we urge the Commission to issue a positive decision with respect to this submission response.

Yours sincerely,



Michael Gill PGeo
Civil Engineer and Hydrogeologist
B.A., B.A.I., M.Sc., Dip Geol, MIEI, MCIWEM

APPENDIX 4:

NOISE

20 January 2026

Jennings O'Donovan
Finisklin Business Park
Sligo
Ireland
F91 RHH9

Attention: Sarah Moore

Dear Sarah,

RE: PROPOSED 9 NO WIND TURBINES, GRID CONNECTION AND ASSOCIATED SITE WORKS LOCATED IN THE TOWNLANDS OF GARRANE, BALLYNAGOUL, CREGGANE AND CHARLEVILLE, CO. LIMERICK

CASE NUMBER: ACP-323635-25

PLANNING REFERENCE: 323448-25

We write in response to the letter from An Coimisiún Pleanála (ACP) letter dated 25 November 2025 inviting submissions on the observations received by the Commission in relation to the above application.

Noise was identified in a number of observations

1. NATIONAL ENVIRONMENTAL HEALTH SERVICE (NEHS)

Noise issues are raised in the NEHS letter of 28 October 2025. Initially the Project Specific Guidance for Wind Energy Development is laid out, identifying the Wind Energy Development Guidelines of 2006. The Draft Revised Wind Energy Development Guidelines were published in December 2019 and remain in draft format and are subject to significant public and stakeholder consultation and liable to change, in line with best practice.

The current 2006 WEGs remain valid until the revised, final version of the draft WEGs are published on wind farm developments.

Webster/Rollo V Meenaclogher (Wind) Limited (2024 IEHC 136)

The NEHS submission states,

The NEHS is aware of the High Court decision in Webster/Rollo V Meenaclogher (Wind) Limited (2024 IEHC 136) 8th March 2024, and details of the judgement. The judgement found that the noise from the wind farm was a Private Nuisance is a predominately health-based assessment, in that the elements that were deemed to create the nuisance were directly related to health effects on the complainants. It is the understanding of the NEHS that assessment of compliance with health protection conditions set in the consent process was not a material consideration in the judgement. The judge did state that she could consider nuisance irrespective of any compliance with consent conditions, particularly in the absence of up to date national Policy and Guidance in the area. The Judgement also states the revised

Draft Guidance has been withdrawn. There is no public indication this is the case. It is still on the Department's website as of the date of this submission.

The NEHS letter goes on to say:

If the Planning Authority are now considering that they are under a duty to incorporate the likelihood of a Private Nuisance into their decision making, then they should consider the judgement in Webster/Rollo V Meenaclogher (Wind) Limited (2024 IEHC 136) 8th March 2024. This judgement identified, in the absence of Irish Guidance, the usefulness of UK Guidance in the investigation of wind farm noise as a statutory nuisance. This is, of course, a reactionary methodology where specific noise exposure is known and not a predictive methodology for the likelihood of a Private Nuisance.

Response:

The DEFRA Guidance referred to above is titled “*Wind Farm Noise Statutory Nuisance Complaint Methodology*” and relates to complaints of statutory noise nuisance within the context of the United Kingdom.

The Executive Summary of this document starts off by saying:

This work was commissioned to examine the use of Statutory Nuisance to deal with wind farm noise complaints when resolution via the Planning System is not possible or has proven to be ineffective.

And the same section of the DEFRA Guidance goes on to say:

Planning controls may offer greater protection of residential amenity than can be achieved via Statutory Nuisance as the latter only covers unreasonable material interference with use of property or personal comfort.....

In our expert view, this is not guidance that should be considered when assessing a planning application under the EIA Directive and does not represent appropriate best practice guidance in that respect.

The DEFRA Guidance provides a literature review and review of legislation which was published in 2011. There has been significant developments in the understanding and how to assess the characteristics of wind turbine noise, particularly in relation to Amplitude Modulation (AM) where Institute of Acoustics (IoA) have provided their own reference method for assessment of AM and the updates provided in the IoA Good Practice Guide represent the best practice for noise modelling and assessment.

This information in conjunction with the current Irish Planning Guidelines are the basis of the noise assessment for this Project.

It should be noted that the planning condition noise limits as set with respect to Meenaclogher Wind Farm (limited to 40 dB LAeq at 5m/s and 45 dB LAeq at 10m/s) differ to those as applied by planning authorities and the ACP with respect to current day wind energy applications. This was specifically highlighted, with the judgement noting the inherent risks where significant time passes between planning permission being granted and a wind farm development being constructed, with the potential for changes in noise impact assessment and statutory controls in the intervening time period. These are matters which the Developer was entirely cognisant of in considering the Proposed Project and the mitigation measures proposed.

In addition, the key consideration in the High Court decision was the presence of amplitude modulation (AM) within the observed noise and how this impacted the complainants. The Judge noted that AM had not been considered at all when permission was granted for the development. In contrast, the potential for AM has been considered and assessed in the EIAR submitted with this application. In Phase 2 of the judgement in this case, the Judge ordered an injunction that specified criteria that accounted for amplitude modulation by limiting the operation of the relevant turbine and restricting the overall noise levels.

The noise chapter associated with the Garrane Green Energy Application identifies AM as a potential issue within **EIAR Section 11.2.7** and provides for a penalty scheme to address any impact that may arise. In addition **EIAR Section 11.7.3** presents mitigation measures to control both overall noise levels and Amplitude Modulation (if present).

As set out in the noise chapter, in terms of overall noise levels, a range sound power operating modes can be applied if it is determined further to a Noise Compliance Monitoring Programme that noise limits are being exceeded. If complaints are received with respect to AM and it is determined further to a Noise Compliance Monitoring Programme that further mitigation measures are required, a curtailment strategy will be developed which will reduce to an acceptable level as defined in **Section 11.7.3** of the **EIAR** or remove the level of AM present under specific operational conditions. The Developer is fully committed to ensuring compliance with planning conditions controlling noise levels and AM (if present) and will implement mitigation measures to ensure compliance.

LIKELY SIGNIFICANT EFFECTS FROM NOISE AND VIBRATION (CHAPTER 11 OF EIAR)

The NEHS make specific comments in relation to the Noise chapter of the EIAR, taking them in order:

Appropriateness of Daytime Lower fixed Limit

Table 11-12 of the **EIAR** for Garrane Wind Farm presents the proposed operational noise limits. As per **Section 11.3** of the **EIAR**, the selected noise limits are based on the recent decisions of ACP:

An Coimisiún Pleanála Condition 1:

- (a) between 7am and 11pm:
 - (i) the greater of 5 dB(A) L90,10min above background noise levels, or 45 dB(A) L90,10min, at wind speeds of 5m/s or greater,
 - (ii) 40 dB(A) L90, 10min, at all other wind speeds.
- (b) 43 dB(A) L90,10min, at all other times.

Or An Coimisiún Pleanála Condition 2:

- a) *For the daytime period 0700 to 2300, in quiet environments, where background noise is less than 30dB(A)L90 T10, a maximum noise level of 40dB(A)L90T10,*
- b) *For daytime periods, 0700 to 2300, where the background noise level exceeds 30dB(A)L90 T10, the greater of 45dB(A)L90 T10, or 5dB(A) above background Levels*
- c) *For the nighttime period 2300 to 0700, for all noise environments, 43dB(A)L90T10*

The NEHS query the selection of the 40 dB LA90,10min lower fixed limit for daytime in quiet environments, it is the lowest fixed limit in the conditions above, thus the assessment methodology in the EIAR meets the most conservative limits in recent ACP decisions.

Given the above, the Garrane Project reliance on a 40 dB LA90,10min lower fixed limit for daytime in quiet environments would be deemed reasonable and in line with recent ACP decisions. It has also been demonstrated in the EIAR that reliance on same will not be likely to give rise to a significant effect.

BS4142

The NEHS reference British Standard BS4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'.

Section 1.3 of BS4142 states,

“The standard is not intended to be applied to the rating and assessment of sound from: ... h) other sources falling within the scopes of other standards or guidance.”

Given that there are standalone noise standards for wind energy developments, it is clear that BS4142 was not intended to be applied to the rating and assessment of sound from wind energy developments and as such should not be referenced with regard to wind energy developments.

Amplitude Modulation

Section **EIAR 11.2.7** confirms that Amplitude Modulation is a naturally occurring feature of wind farm operation that can be mitigated with a penalty scheme depending on its intrusiveness. If it was the case that the Garrane Green Energy Project was to present levels of amplitude modulation that would be deemed sufficient to require a rating penalty, as identified through a Noise Compliance Monitoring Programme, there are a number of mechanisms available to the operators to reduce both the presence of elevated levels of amplitude modulation and overall noise levels. This is principally through a curtailment strategy including adjusting the angle of attack of the blades and operating turbines in different noise control modes (as presented in **Section 11.7.3** of the **EIAR**).

Within the Webster, Rollo V Meenaclogher (Wind) Limited High Court decision, the judge ordered an abatement strategy which curtails the nearest wind turbine, dependant on wind speed and direction to remove the claimed nuisance. The Developer has committed to applying, amongst other things, an abatement strategy in the event AM generates an exceedance to the stated noise levels (**Section 11.6.6** of the **EIAR**).

World Health Organization – Environmental Noise Guidelines for the European Region 2018

The NEHS state that

...the most appropriate criteria for assessing significance of the predicted noise would be consideration of the Environmental Noise Guidelines for the European Region, 2018

As identified within **Section 11.2.3.5** of the **EIAR** the RPS Group in November 2018 published the report “Draft Wind Energy Guidelines – Wind Turbine Noise Analysis” on behalf of the Department of Communications, Climate Action and Environment.

The Executive Summary states,

The Draft Wind Energy Development Guidelines are based on a rated noise exposure level of 43 dB(A) on an LA90,10min measurement basis. The World Health Organisation (WHO)

Environmental Noise Guidelines for the European Region (WHO, 2018) set a Conditional Recommendation for wind turbine noise of 45 dB on an L_{den} basis.

The difference between these levels is comprised of the following elements:

- A correction of +2 dB(A) to convert the Relative Rated Noise Limit which is measured in accordance with the IoA Good Practice Guide (2013) on a LA90 basis to a LAeq basis.
- A correction of + 6.4 dB(A) to include the evening and nighttime noise penalties built into the Lden.

Wind turbine noise modelling at planning stage is carried out using worst case (maximum) noise output from the turbines. Due to weather conditions wind turbines do not operate at full power all the time, the anticipated noise emission will therefore always be less than the worst case scenario.

RPS was requested by the Department of Communications, Climate Action and Environment to carry out an analysis of long-term wind speed data with typical large turbine noise data to compare the average sound output to the worst case condition under long term average conditions.

RPS collated 30-year wind data for Malin Head, Valentia and Mullingar. The three sites show an expected range of differences in wind speed; Malin Head being the most exposed coastal site, Mullingar being the most sheltered inland site and Valentia being somewhere in between. Using sound power level data from three wind turbine manufacturers, the long-term average sound power output over the relevant range of wind speeds was calculated.

The correction required is in two parts, one to convert between the noise indicators and the other to incorporate the penalties included in the Lden indicator. A correction of +2 dB(A) is required to convert the Relative Rated Noise Limit which is measured in accordance with the IoA GPG on an LA90 basis to an LAeq basis.

Calculating out the Lden with the appropriate penalties for the evening and night periods adds a further 6.4 dB(A) to the noise level when measured as LA90. This means that the 'correction' between the measured wind turbine noise level and the WHO Conditional Recommendation is a total of -8.4 dB(A), i.e. the average measured noise level must be significantly lower than the worst case noise prediction.

Corrections required to adjust for wind speed, wind direction, time of day wind variations and grid curtailments and constraints were examined. The corrections were calculated to range from -7.1 dB(A) for locations close to the turbines and -9.1 dB(A) for locations remote from the turbines.

It is reasonable to conclude from both these calculations that the annual average noise output from wind turbines in Ireland will be sufficiently lower than the maximum rated sound power to be consistent with the WHO guidelines."

The RPS Group report concludes,

the corrections are sufficient to confirm that the Relative Rated Noise Limit level is consistent with the WHO guidelines.

As noted above, the 30 years of meteorological data collected at three locations across Ireland when calculated as a correction to be applied to the Lden value notes a correction in the range of 7.1 dB to 9.1 dB. Given that these corrections are higher than the 6.4dB correction, this demonstrates that compliance with the Wind Energy Development Guidelines 2006 noise limits will also demonstrate compliance with the WHO LDEN guidelines.

Reliance on the operational noise limits as stated within **Table 11.17** of the **EIAR** for the Project, will ensure compliance with the WHO LDEN guidelines.

Background Noise Measurements

The background noise levels are presented in **EIAR Table 11.11**, rather than the 12.9 referenced in the NEHS response.

ETSU-R-97 does not define low background noise levels, so this reference is not correct.

The WEDGs 2006 does define low noise environments as:

.....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).

There are no daytime noise levels in **EIAR Table 11.11** that are below 30dB LA90, so the site does not meet the criteria for a low noise environment.

2. Limerick City and County Council – noise report

Responding to the issues raised by the Limerick City and County Council in the order presented:

Mapping Error

“There is an error of the mapping of at least of Appendix 11.1 (Noise Monitoring Locations and the Proposed Development). The mapped locations of the noise monitors seem to be plotted approximately 50metres to the NE of the coordinates presented in Table 11.10 of the EIAR (ITM) (see attached). For example, the coordinates for NML3 (Table11.10) actually plot the south of the River Loobagh. The coordinates for NML3 in Table 11.10 are likely to be correct based on the photograph of the monitoring location (Appendix 11.1).It also appears that the turbine locations in Appendix 11.4 map are plotted slightly west of the coordinates provided in Table 2.3 of the EIAR (e.g. see map for T3, T5 and T8). Consequently, the noise contours have potentially also be plotted incorrectly in Appendix 11.4 (Soundplan Noise Outputs). While it appears that the noise sensitive receptors have been plotted accurately in Appendix 11.1 it is recommended that the geographic coordinates of the input and output files for the noise calculation models should be reviewed as the error may compromise the accuracy of calculations at noise sensitive locations.”

Response:

The co-ordinates of the wind turbines and the receptors have been reviewed, and they are consistent with the application. Therefore, the predicted noise levels are accurate.

In relation to the location of the noise monitoring location, they were located as per the co-ordinates presented in **EIAR Table 11.10**. The mapping of these locations is for indicative purposes only and to give the reader context. The locations are appropriate and indicative at the scale of the mapping.

Representativity of the Noise Monitoring Locations

“Background surveys provide the basis for setting the day-time and night-time noise limits and should reasonably represent the external noise environment for noise sensitive locations. The Good Practice

Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbines Noise (GPG) outlines recommendations for siting measurement equipment....

The noise monitoring locations for this site can be generally considered as those along the N20 effected by road noise, NML1 and NML4 (to the west), and those not near the N20 which are less effected by road noise, NML2 and NML3 (to the east).....

The Wind Energy Development Guideline (2006) state that: Noise limits should apply only to those areas frequently used for relaxation or activities for which a quiet environment is highly desirable, and so the background noise levels should reflect this (for the setting of noise limits). It is considered that the background noise measurements from the four noise monitoring locations do not reasonably/typically represent low levels of background noise in the vicinity of dwellings...

It is my opinion that the background noise survey is not adequate to inform appropriate noise criteria at noise sensitive locations and therefore it is not possible to make a decision on the proposed development."

Response:

The Good Practice Guide to Applications of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise (IOAGPG) Section 2.5 identifies the guidance for siting noise monitoring equipment to establish typical noise levels. We comply with this guidance.

Limerick CoCo state:

Background surveys provide the basis for setting the day-time and night-time noise limits and should reasonably represent the external noise environment for the noise sensitive locations

This would be more applicable for a UK assessment where the daytime noise limits are primarily set 5dB above the background noise level, with a fixed limit between 35 to 40dB.

Under Irish planning, the WEDGs 2006 provides different criteria for setting noise limits:

In general, a lower fixed limit of 45 dB(A) 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.

The IOAGPG asks you to assess typical noise levels. In the case of this site the properties to the west of the Project will have a noise contribution from the N20 road. This was highlighted in our assessment. The noise monitoring locations to the east of the Project are further away from the road and have lower noise levels.

Unless the site is a low noise environment during the daytime, which it is not, the lowest fixed limit for wind turbine noise is 43dB LA90. We assessed this site in line with a 43dB limit, which is consistent with the An Coimisiún Pleanála (ACP) decisions identified in **Section 11.2.3.2** of the **EIAR**.

None of the 4 monitoring locations showed measured noise levels below 30dB during the day for any wind speeds when the turbines are operational. The noise sensitive receptors in the vicinity of this site are not in a low noise environment, so the background noise levels would only have the effect of increasing the noise limits applicable to the site.

Noise measurements were taken in areas that are representative of typical noise levels in the vicinity of noise sensitive receptors; proximity to hedgerows and rivers were considered in the selection of the noise monitor locations and were not identified as causing an increase in noise levels and all periods where rain was identified from the rain gauge were excluded from further analysis of the background noise levels.

Setting of Noise Limits

“...It is considered that the proposed noise limits in the EIAR have the potential to allow a significant difference between wind turbine noise levels and background noise in outdoor private amenity areas at noise sensitive locations, at least away from the N20. The proposed method of settling noise limits for day-time is not consistent with WEDG (2006) and that cognisance for the LDP should be had for the setting of night-time noise limits.”

Response:

The method relied upon in setting noise limits are outlined in the EIAR and consistent with the WEDGs 2006 and ACP. Planning conditions. The comments in relation to the Limerick County Development plan are noted.

The WEDGs 2006 does not provide detailed methodology from ETSU-R-97, it is simply highlighted as a reference to the guidance.

The reference to Condition 1 (CDN1) and Condition 2 (CDN2) relates to the two different noise conditions recently applied by ACP and presented in Section 11.2.3.2 of the EIAR.

CDN1 states:

- (a) *between 7am and 11pm:*
 - (i) *the greater of 5 dB(A) L90,10min above background noise levels, or 45 dB(A) L90,10min, at wind speeds of 5m/s or greater,*
 - (ii) *40 dB(A) L90, 10min, at all other wind speeds.*
- (b) *43 dB(A) L90,10min, at all other times.*

The 40dB highlighted in the LCCC response relates to a daytime wind speed of 4m/s. As the daytime is between 07:00 and 23:00hrs and the wind speed is less than 5m/s, the 40dB limit was applied. The methodology used to set these parameters is consistent with WEDGs 2006, the current applicable guidelines and, as such, aligns with the methodology that is consistently applied by An Coimisiún Pleanála in applying noise planning conditions to wind farms. This is considered an acceptable approach.

The Limerick City and County Council referenced the UK planning guidance PPG24. There is no reference to PPG24 in the WEDGs 2006 guidelines and therefore there is no demonstrable link between the two documents. Furthermore, the PPG24 has been replaced in the UK by the *ProPG: Planning and Noise* document, which operates on a similar basis to the previous PPG24 document.

ProPG contains a sliding scale of noise levels that will have an impact on residential dwellings, but they are based on a 16-hour daytime period or an 8-hour nighttime period. These LAeq levels are not applicable to wind turbine development where there are specific guidelines to be followed. The ProPG, like the previous PPG24 primarily relates to transportation noise.

Special Audible Characteristics

“Special audible characteristics including amplitude modulation (AM), low frequency noise (LFN) and infrasound are discussed in the EIAR. However, there is no consideration of tones and the discussion regarding infrasound and LFN is ambiguous. The potential for tones should be addressed in the EIAR.....

It is not possible to predict the occurrence of any SACs, if they occur, at the planning stage and also without knowing the final turbine type (for tones). It is recommended by LCCC that if any planning is granted then a condition should be attached to support the Planning Authority and require the investigation of special audible characteristics (including amplitude modulation, low frequency noise and tones) in event of a complaint regarding any or all of those characteristics.”

Response:

The comments are noted in relation to Special Audible Characteristics (SAC) and as stated by LCCC, *“It is not possible to predict the occurrence of any SACs, if they occur, at the planning stage”*. However, guidance from the IOA and updated IEC and ETSU reviews have provided a clearer picture with regard to how SAC's should be assessed, should they occur during operation

Each SAC (including AM, Low Frequency Noise, Tones, etc.) can be assessed in the form of a penalty to an overall noise level, which can be mitigated in terms of operational mode of the turbines, should the SAC become evident after the site becomes operational, these would be mitigated in accordance with **EIAR Section 11.2.7**.

Construction Noise

“The EIAR specifies the use of BS 528-1:2009 + A1 Code of practice of noise and vibration control on construction and open sites – Part 1 (Noise) of the control of construction and decommissioning noise.... It is also indicated in BS 5228-1:2009 +A1:2014 that where construction works involve long-term and substantial earth moving activity (Section E.5) and that the use of Mineral Policy Statement 2 needs to be taken into account when setting noise criteria for acceptability...”

Response:

The comments in relation to Construction Noise are noted. To clarify, the programme for the entire construction is estimated at 18-month duration, however, this will not constitute substantial earth moving for the entirety of the programme. It should also be noted that the site spans approximately 3km from the site entrance to the south east to the location of T8 to the north of the site and that earthworks will transition through the site as the programme progresses, it is highly unlikely that substantial earthmoving will take place in a single location for a continuous 6 month period. For the above reasons, we don't agree that the works are similar in nature to mineral extraction as it doesn't involve long-term and substantial earth moving or works typical of mineral extraction (i.e. rock blasting etc.)

I hope that this information is of assistance. Should anything further be required, please do not hesitate to contact me.

Yours faithfully,

IRWIN CARR CONSULTING

A handwritten signature in blue ink, appearing to read 'Shane Carr', with a stylized flourish underneath.

SHANE CARR

DIRECTOR

APPENDIX 5:

LANDSCAPE AND VISUAL IMPACT

Landscape and Visual Observations Response

Garrane Green Energy application

Macro Works

January 2026



1 CONTEXT

This Landscape and Visual submissions response relates to the application for the proposed Garrane Green Energy Project located within the townlands of Ballynagoul, Creggane, and Garrane, Charleville and Kilmallock, County Limerick.

A number of observations have been received from statutory bodies and the public in relation to the proposed wind farm with some being focussed on the potential landscape and visual impacts of the proposed Project. As Macro Works Ltd prepared the Landscape and Visual Chapter and prepared photomontages to support both the LVIA and the Cultural Heritage assessments, it is deemed appropriate that we should respond to the LVIA aspects of the statutory consultee / 3rd Party observations.

2 RESPONSE TO OBSERVATIONS

Office of Public Works (OPW) Observations

Anthony Read (Principal Officer – Heritage Services)

In terms of landscape and visual effects this submission focusses on the effects on national monuments that are in state care. It lists 14 such national monuments within the 20km radius study area and acknowledges that some, but not all of the monuments have been assessed within the EIAR. The submission addresses four of the heritage sites specifically and these will be the focus of the LVIA response. The four heritage sites include;

1. Kilmallock National Monuments (No.s 212, 408, 173, 680)
2. Lough Gur
3. De Valera's Cottage
4. Lisscarroll Castle

Before responding in respect of specific monuments, it is important to note that visual effects occur in relation to visual receptors and visual receptors are people / groups of people experiencing views from different locations and contexts that influence their sensitivity to visual change (according to relevant guidance; GLVIA – 2013). It is very common that statutory bodies and planning authorities request assessment of visual effects on a particular monument and this is only relevant to LVIA when that monument attracts regular visitors – in which case it will be assessed by the LVIA specialist in terms of the visual effects on those visitors and by the Cultural Heritage specialist in relation to effects on the setting of the monument (both may use photomontages to inform their assessment). If it is a monument that is in private ownership and / or is not regularly visited by the public, only the Cultural Heritage assessment of effects on its setting is relevant. This is an important distinction to make because it ensures that neither the LVIA specialist nor the Cultural Heritage specialist find themselves making non-expert judgements in relation to the other's field of expertise and also so that the planning authority is fully aware of the relative assessment responsibilities.

1. Consideration of Visual Effects at National Monuments

Kilmallock National Monuments (No.s 212, 408, 173, 680)

The visual impact assessment uses a viewpoint overlooking the GAA ground at Kilmallock to assess views from the village in a general sense, which can be deemed to cover those national monument that occur there. GAA grounds and church yards / graveyards are often used as representative visual receptor locations for settlements because they are community nodes and they are often elevated or have clear foregrounds that allow a higher potential for visibility than enclosed urban views. It should be noted that the selection of the Kilmallock viewpoint (VP11) for the Visual Impact Assessment was intended to best represent the nature of views afforded to the residents of Kilmallock (as visual receptors) rather than particular national monuments.

The OPW submission states that the assessment at VP11 *“...is relying on screening by trees, which, if deciduous will provide reduced screening for half of the year, and which may be prone to normal and climate change accentuated risks such as storm, pest and disease damage and/or loss. In addition, if the trees are outside the ownership and control of the applicant, the maintenance of the screening effect is outside of their control”*.

By way of response it should be noted that the influence of intervening vegetation screening in the intervening landscape is a key consideration of any visual impact assessment and it is incumbent on the visual assessor to consider the nature of that screening i.e. is it one or two trees in the immediate foreground, which will not have the same screening effect even a metre to the left or right, or is it a mature forest plantation likely to be felled within a couple of years. In the case of VP11, it is a dense band of mature, mixed-species trees in the middle ground that partially screen the proposed turbines. Even in winter, distant vegetation such as this is not as visually permeable as it would be in the immediate foreground due the dense branch structure. This can be referred to as 'the net curtain effect' where close proximity visual permeability is afforded, but this decreases with distance. Whilst there may be marginally increased visibility through the tree tops from VP11 during winter

months, this would not alter the impact assessment in relation to turbines that are nearly 7km away. Furthermore, there is no particular reason to consider that all layers of the intervening screening vegetation will be removed or die within the foreseeable future. In that unlikely circumstance, the bare-ground wireframe image submitted with the VP11 photomontage image illustrates the scale and nature of the development that could be seen and this is not a view that would give rise to significant effects.

Lough Gur

In relation to Lough Gur, the OPW submission states; “Lough Gur is located 17km to the northwest (VP21). The OPW notes that the turbines will be located in the centre of the protected view from this highly significant archaeological site and location of natural beauty. The OPW is concerned about the visual impact of this proposed development and the cumulative impact as presented in the planning application documentation”. A zoomed-in screengrab from the VP21 – Lough Gur photomontage is also presented with the above text. The inclusion of this image, which already forms part of the planning application documents, is relevant because it is not presented at the correct scale and tends to overemphasise the visual effect in order to support the concerns raised in the text.

It is relevant to highlight that the submission does not take issue with the methodology or rigour of the assessment at Lough Gur, but instead, the ‘Slight / Adverse’ (not significant) level of visual impact assessment. It also uses a zoomed-in screen shot of the turbines, which can be misleading compared to the full scale photomontage, which has been prepared in accordance with relevant guidelines to appropriately represent scale, distance and context. By way of response, the methodology section of the **EIAR LVIA chapter (12.2)** is relevant as this sets out that the significance of effect is determined by weighing the sensitivity of the visual receptor against the magnitude of visual impact, all in accordance with relevant guidelines (GLVIA – 2013). In the case of VP21, the sensitivity of the Lough Gur scenic view is duly acknowledged to be ‘High’. However, at a viewing distance of 17.4km the proposed turbines are a distant background feature of the vast agricultural plains and the overall significance is deemed to be ‘Slight’. This level of significance, which is some distance from being deemed a significant effect, is considered to be appropriate in the context of the relevant methodology and guidance.

De Valera’s Cottage

De Valera’s Cottage is a small unassuming roadside dwelling approximately 1km north of the village of Bruree and 4km from the nearest of the proposed turbines. It has been preserved in the manner it would have been kept when Eamonn De Valera lived there in his early life and now forms part of the De Valera Museum and Bruree Heritage Centre.

The OPW submission states that “Despite the proximity of De Valera’s cottage, the visual impact on this heritage property has not been undertaken. The OPW requests that An Coimisún Pleanála seek verifiable visual impact assessment documentation as additional information (e.g. wireframe/photomontage) to demonstrate the visual impact, if any, on this statutorily protected heritage property. Any impact assessment should include cumulative impacts”.

Although the OPW request is not an unreasonable one, it is considered unnecessary. From a visual receptor (visitor) perspective, the experience of visiting De Valera’s Cottage would appear to be largely an internal / insular one i.e. inside the cottage rather than relating to the particular landscape and visual setting of the cottage. Furthermore, the cottage is surrounded by dense vegetation at close quarters and the Route Screening Analysis (RSA) undertaken as part of the LVIA illustrates that there is no visibility of the proposed turbines anywhere in the vicinity of the cottage (See Figure 1 below).

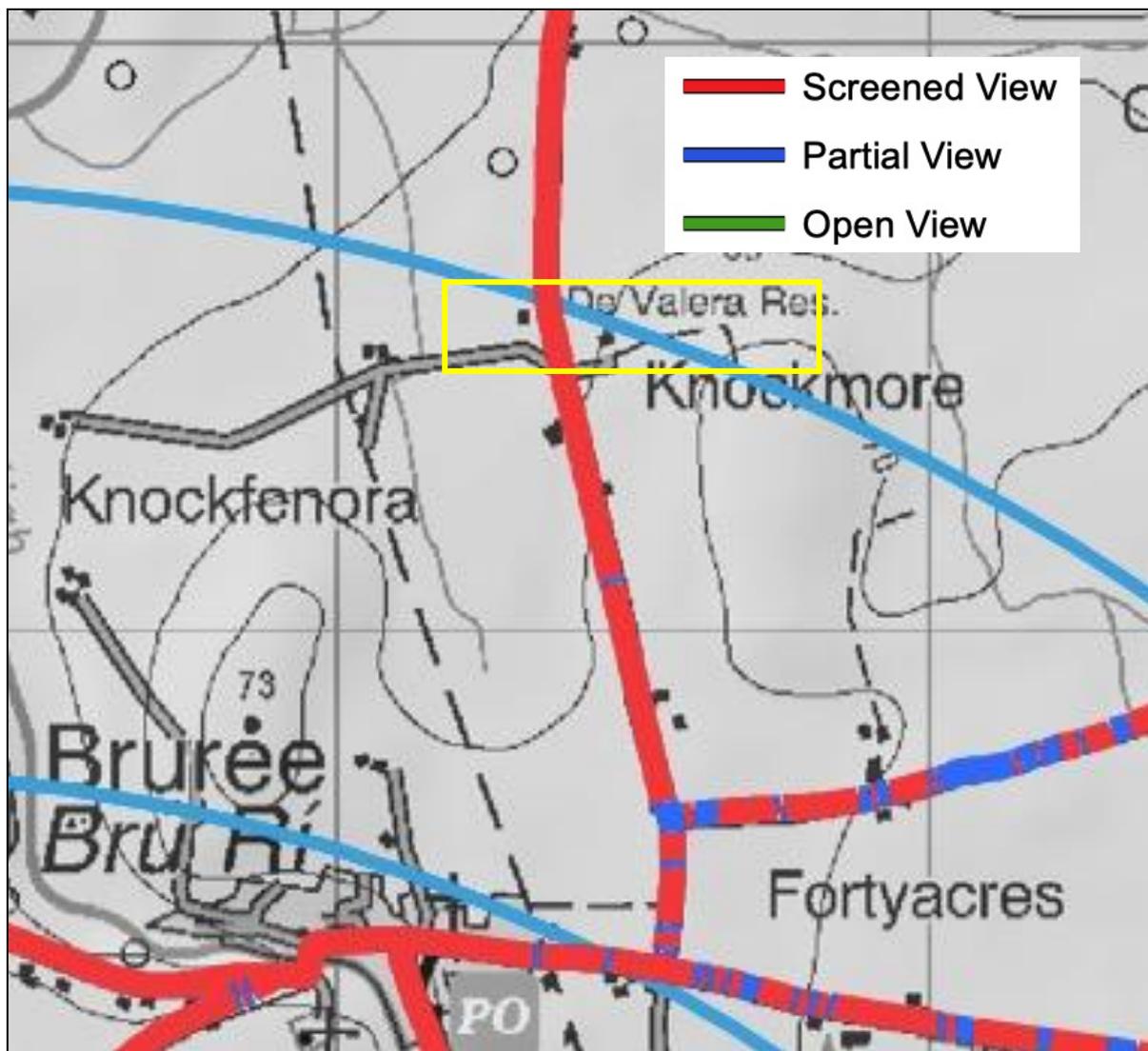


Figure 1 – Excerpt from Figure 12.10 of the EIAR – Route Screening Analysis Map

Liscarroll Castle

As with De Valera's Cottage "The OPW requests that An Coimisiún Pleanála seek verifiable visual impact assessment documentation as additional information (e.g. wireframe/ photomontage) to demonstrate the visual impact, if any, on these statutorily protected heritage properties. Any impact assessment should include cumulative impacts".

Again, the OPW request is not an unreasonable one, but it is considered unnecessary to undertake. Liscarroll Castle, aside from being 16.5km from the nearest of the proposed turbines, is contained in a general area that is shown by the bare-ground ZTV map to have little potential for visibility of the proposed Project. Indeed, the castle falls just outside of the ZTV pattern (See Figure 2 below). Even if it fell just inside the ZTV pattern (indicating some potential for turbine visibility), it would be blade tip visibility and any intervening skyline vegetation (not accounted for by the ZTV map) would preclude actual visibility.



Figure 2 – Excerpt from Figure 12.9 of the EIAR – Zone of Theoretical Visibility Map

Limerick City and County Council (LCC) – Conservation Officer

Shona O'Keefe (Executive Architectural Conservation Officer)

In this submission it is contended that the LVIA does not include consideration of all cultural heritage assets within the wider setting, including the Kilmallock Architectural Conservation Area (ACA) and several designed landscapes included on the NIAH Historic Garden Survey.

By way of response, it should be noted that the residents of Kilmallock are represented by a viewpoint (VP11) that was used in the visual impact assessment. The visual impact at Kilmallock has been further detailed above in relation to the OPW submission. As this aspect of the LCCC submission is specific to Architectural Conservation, it will be addressed by the project Cultural Heritage specialist elsewhere in this response document to avoid non-expert opinion from the LVIA specialist.

In relation to designed landscapes and specifically those historic gardens that are on the NIAH Historic Garden Survey, it should be noted that those referenced by the LCCC Conservation officer, which are closest to the site, are all currently contained in private agricultural use. Thus, they present as typical farmland and do not appear to attract public visitation, which is necessary to be considered a relevant visual impact receptor. They are, in theory, relevant landscape receptors but again, this is largely dependent on whether they distinctly contribute to a sense of heritage in the local landscape, which is limited by being contained in typical agricultural farmland. The specifically referenced historic gardens are each addressed below;

Creggane Castle (NIAH ref. 1639) is a remnant structure and the aside from a roadside stone wall the landscape appears as a modern day farmyard surrounded by typical agricultural fields, albeit with some mature trees within the hedgerow network. It is over 1km from the nearest turbine on the opposite side of the N20 national road where it is also flanked to the west by the linear settlement of Cregane. Representative viewpoint VP7 from the N20 only 300m to the southeast provides a sense of the scale and nature of views from within the same vicinity, but provides a more open view. Effect will be not significant.

Bruree House (NIAH ref. 1640) is now a garden centre surrounded by typical agricultural fields, albeit with some mature trees within filed boundary hedgerows. There is little sense of it being part of a designed landscape. It is nearly 2km north from the nearest turbine and visual effects will be not significant.

Maiden Hall (NIAH ref. 1641) appears as a farmstead set back from surrounding roads by more than 250m in all directions and contained in well maintained agricultural fields some 2.8km south of the site. There are some mature treelines within the estate, but this alone does not give a strong sense of landscape heritage or belonging to a designed landscape. Surrounding roads show little or no visibility of the proposed turbines in the Route Screening Analysis. Due to distance and screening visual effects will not be significant.

Treanlewis House (NIAH ref. 1642) appears to be a remnant estate where agricultural farmland has been left largely unmanaged and reverted to rushes and scrub and there is little sense that it is

part of a former designed landscape. Viewpoint VP6 is immediately adjacent to the west and gives a sense of the scale and nature of visibility. Visual effects will not be significant.

Third Party Submissions

There are 59 third party submissions to the application, which have been reviewed. Many of the landscape and visual related issues are common across the submissions so it is considered more useful to respond to the issues by theme or highlight distinctive submissions than repetitively in respect of each submission. The common themes / distinctive issues that will be addressed include;

1. Turbines too tall
2. Industrialisation of the rural landscape
3. The turbines will intrude on views of the Ballyhoura Mountains
4. Cumulative impact between developer's Garrane and Ballinlee Wind Farms not properly assessed

1. Turbines too tall

Many of the 3rd party submissions take issue with the height of the proposed turbines, considering them to be too large for this rural setting. Indeed, the submissions from Frank Kelly and Brendan Hogan both mention the height of the turbines relative to the height of the spire of Charleville Church, that being a large and familiar building in the surrounding context.

By way of response, it is important to note that comparison with other tall features is only relevant when their setting is similar and their form / function comparable. The proposed turbines will be visible within a broad scale rural landscape setting where they may be prominent in some instances, but due to the slender form and set back distances from roads and residences, they do not appear overbearing or spatially dominant within views.

Although 170m turbines are notably larger than the first generation turbines that were constructed in Ireland as the wind energy industry emerged around two decades ago, the proposed turbines would only be classed as mid-range in height by today's standards. A number of wind energy applications have been submitted and granted in recent years with turbines at or in excess of 200m. These tend to be in broad peatland settings, but by the same rationale, the proposed 170m tall turbines do not appear over-scaled in their broad rural context. This is reflected in the findings of the LVIA chapter, which acknowledges several mid to high ranges effects, but none that are deemed significant. Furthermore, the LVIA includes a Route Screening Analysis (RSA) that reinforces that within relatively short distances (even less than 1km), it is considerably more likely that the proposed turbines will be fully screened by intervening terrain and vegetation than openly visible.

2. Industrialisation of the rural landscape

Many of the 3rd party submissions contend that the proposed wind farm will spoil the natural beauty of the area and contribute to the industrialisation of the rural environment. For example, the submission from Andy O'Mahony states that; *"The proposed wind turbine height of 170m with blade rotor of 150M x 9 will alter the beautiful rural landscape. These turbines will dominate the skyline be visible for miles around including nearby town Charleville as well as Bruree / Rockhill & Colemanswell and much farther beyond and will seem intrusive to many houses and business in the area"*. The submission from Andrew and Breeda Cussen suggests; *"The turbines will dominate the rural landscape, altering its natural beauty, character and visual appeal"*. The submission from Anne Walsh and Family states that; *"This area is a rural and farming community, not an industrial zone. The proximity to homes, farms, and community amenities makes it entirely unsuitable for a wind farm of this scale"*.

By way of response, local residents will invariably and understandably extol the virtues of their local landscape, however, it is important that the LVIA takes an objective stance and also considers the receiving landscape in the national and regional context in terms of distinctiveness, quality and value. In this instance, the LVIA highlights that in accordance with the Limerick County Development Plan 2022-2028, the receiving landscape is a general rural one; LCA 01 – 'Agricultural Lowlands'. This Landscape Character Area is not classified as being of high value or sensitivity and has associated policies that seek to support the established rural economy rather than provide a high degree of protection to the landscape. By any measure, it is predominantly a productive and modified landscape rather than a pristine and naturalistic one. Even the frequently referenced Ballyhoura Mountains are notably modified by agriculture, extensive commercial conifer plantations and wind energy development.

In addition to the above, the Wind Energy Strategy for County Limerick identifies that the proposed Project falls within an area that is a 'Preferred' one for wind energy development, this being the most favourable classification within the County. Furthermore, there are no scenic designations (scenic routes / views) in either the Limerick or Cork County Development Plans within 10km of the site.

As a more general point, it is common for observers to claim that a proposed wind farm will contribute to the urbanisation or industrialisation of the rural landscape, however, this has connotations that do not reflect the reality of wind energy development in Ireland. It is accepted that the proposed wind turbines and ancillary structures will contribute to an increase in the scale, intensity and diversity of built development within the receiving rural landscape. However, wind turbines have become synonymous with rural, upland and cutover peatland areas in Ireland over the past 25 years – not urban or industrial areas. They are structures that require broad, exposed and often isolated settings to function effectively and tend not to be developed near urban areas due to issues associated with population density. Describing a structure as contributing to industrialisation of a landscape invokes images of bulky monotone buildings and chimney stacks - whereas, wind turbines are structures of the rural landscape with a direct connection to the elements.

3. Intrusion on views of the Ballyhoura Mountains

A number of the submissions raised concerns about the visual intrusion of the proposed turbines on views of the rural landscape and the submission from Brendan and Mary McKiernan also stated that: *“The proposed turbines are huge and unsightly and will have a negative visual impact on the environment. We will be looking directly at them as they are proposed to be between our house and Charleville and will obstruct our view of the beautiful Ballyhoura mountains”*.

By way of response, it is noted that the vast majority of representative views / photomontages showed the proposed turbines rising above a near or middle distance flat vegetated skyline where they rose into view (sometimes prominently) but did not obscure views of the landscape beyond. When viewed from the rural lowlands to the north of the site the turbines were generally not seen to obscure or unduly intrude on views of the distant Ballyhoura Mountains. Furthermore, as noted above, the Ballyhoura Mountains are not a dramatic landscape feature, but instead a productive upland area characterised by agriculture, forestry and wind energy development.

Notwithstanding the above, the Ballyhoura range does afford some elevated views looking north towards the proposed wind farm where it is presented against a rural backdrop. However, as described in the visual impact assessment of such views, the development is well assimilated in terms of scale and function within the productive rural setting.

The proposed Project will inevitably intrude on some views, but the LVIA considered that there would not be significant visual effects.

4. Cumulative impact between developer's Garrane and Ballinlee Wind Farms not properly assessed

Though not a common theme, the Bruff Dromin Athlacca – Ballinlee Community Action Group contend that *“Insufficient cumulative assessment between Garrane and Ballinlee Windfarms despite clear views of notable views and prospects Lough Gur and Ballyhoura, with no intervening terrain between the two sites, and assertion that there is very low potential for intervisibility is inaccurate”*.

By way of response, it is important to note that the Ballinlee Wind Farm was included within the cumulative assessment and that the overall assessment of cumulative effect was 'Low'. As highlighted in the assessment, there is a considerable distance of nearly 10km between the two developments and the Route Screening Analysis (RSA) for the proposed Project indicates a high degree of screening within the surrounding rural lowland landscape – a similar landscape setting shared by Ballinlee Wind Farm. There will be combined views of both developments from some elevated locations such as within the Ballyhoura range, but in such circumstances, they appear as widely separated and discrete features.

APPENDIX 6:

ARCHAEOLOGY & CULTURAL HERITAGE

Department of Housing, Local Government and Heritage (DHLGH)

The DHLGH submission states that exclusion zones may be necessary to protect vulnerable heritage assets located in proximity to the proposed Project and to ensure that they are safely preserved in situ during the construction phase. In that regard, the DHLGH advises that similar measures may be required at decommissioning phase also and that the advice of a suitably qualified archaeologist may be needed to inform any plan for decommissioning of the development.

The DHLGH submission also notes the potential for the presence of archaeological sites not listed in the Sites and Monuments Record within the proposed Project site which may be vulnerable to direct impacts from construction activity. These include a possible ring-ditch within the sub-station compound, a possible rectilinear earthwork at/adjacent to T06 and a possible rectilinear earthwork at proposed temporary spoil storage to west of T09 access road. The DHLGH also note three possible ring-ditches within the environs of T09 and associated infrastructure and state that full exclusion zones of appropriate size and scale would need to be put in place and secured/demarcated to ensure the preservation in situ of these sites during construction and decommissioning phases. The potential for the presence of further sub-surface archaeological sites within the proposed Project site is also noted.

The DHLGH submission advises that the following should be included as conditions of any grant of permission.

1. All mitigation measures in relation to archaeology and cultural heritage as set out in **EIAR Chapter 15** of the EIAR (John Cronin and Associates; date August 2025) shall be implemented in full, except as may otherwise be required in order to comply with the conditions of this Order.
2. The developer shall engage a suitably qualified archaeologist (licensed under the National Monuments Acts) to carry out a pre-development Archaeological Geophysical Survey and a pre-development Archaeological Test Excavation of the development site for all greenfield sections of the development and to submit an archaeological impact assessment report for the written agreement of the planning authority, following consultation with the Department, in advance of any site preparation works or groundworks, including site investigation works/topsoil stripping/site clearance and/or construction works
 - a. The Archaeological Geophysical Survey must be carried out under licence or consent from the National Monuments Service of this Department (as applies) and in accordance with an approved method statement. Having completed the work, the archaeologist shall submit a written report to this Department and the Planning Authority describing the results of the Archaeological Geophysical Survey.
 - b. The archaeologist shall liaise with this Department to establish—based on the results the Archaeological Geophysical Survey—the appropriate scope of the Archaeological Test Excavation to adequately characterise the character and extent of any potential sub-surface archaeological material within the development site.
 - c. The report on the Archaeological Test Excavation shall include an archaeological impact statement and mitigation strategy. Where archaeological material is shown to be present, avoidance, preservation in-situ, preservation by record (archaeological excavation) and/or monitoring may be required.
 - d. Any further archaeological mitigation requirements specified by the planning authority, following consultation with this Department, shall be complied with by the developer.

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- e. No site preparation and/or construction works shall be carried out on site until the archaeologist's report has been submitted to and approval to proceed is agreed in writing with the planning authority.
3. In advance of the commencement of any construction works, the developer shall engage a suitably qualified archaeologist to carry out Full Archaeological Excavation (licensed under the National Monuments Acts) of newly identified archaeological sites at the sub-station, T06 and spoil storage at T09.
- a. The Full Archaeological Excavation shall be carried out according to Best Archaeological Practice and in accordance with an approved Method Statement that shall incorporate a strategy for environmental sampling, finds retrieval and conservation and subsequent publication or other suitable dissemination of results
- b. If significant archaeological features are discovered during the course of the Full Archaeological Excavation, work on site shall stop pending a decision of the planning authority, in consultation with this Department, regarding appropriate additional mitigation measures, which may include preservation in-situ or full archaeological excavation. Any additional archaeological mitigation requirements specified by the planning authority, following consultation with this Department, shall be complied with by the developer.
- c. No construction works shall be carried out on site until a Preliminary Excavation Report on the Full Archaeological Excavation has been submitted to this Department and the Planning Authority and approval to proceed is agreed in writing.
- d. The developer shall ensure that any necessary Post-Excavation Analysis—as set out in the Preliminary Excavation Report—including (but not limited to) specialist analysis of finds and samples, scientific dating and conservation of artefacts is completed.
- e. The developer shall ensure that the results of the Full Archaeological Excavation are adequately disseminated to the public by way of publication or other appropriate means.
4. A suitably qualified archaeologist shall be retained to advise on, and establish appropriate Exclusion Zones around the external-most elements of vulnerable Heritage Assets located within the development site (as identified in **Chapter 15** of the **EIAR** or by any subsequent investigations associated with the project).
- a. Exclusion Zones shall be fenced off or appropriately demarcated for the duration of construction works in the vicinity of the monuments. The location and extent of each Exclusion Zone and the appropriate methodology for fencing off or demarcating at each location shall be agreed in advance with this Department and the planning authority.
- b. No groundworks of any kind (including but not limited to advance geotechnical site investigations) and no machinery, storage of materials or any other activity related to construction will be permitted within Exclusion Zones.
5. The Construction Environment Management Plan (CEMP) shall include the location of any and all archaeological or cultural heritage constraints relevant to the proposed Project as set out in **Chapter 15** of the **EIAR** and by any subsequent archaeological investigations associated with the project. The CEMP shall clearly describe all identified likely archaeological impacts, both direct and indirect, and all mitigation measures to be employed to protect the archaeological or cultural heritage environment during all phases of site preparation and construction activity.
6. The Developer shall retain the services of a suitably qualified archaeologist to advise on an archaeological mitigation plan for decommissioning of the development, to include mitigation

measures for the removal of the turbines and the protection of any archaeological sites and monuments that are in situ at the site. The Decommissioning Plan shall be updated to include the location of any archaeological or cultural heritage constraints as set out in **Chapter 15** of the **EIAR** and by any subsequent archaeological investigations associated with the project. It shall clearly describe all identified likely impacts from decommissioning—both direct and indirect—and all mitigation measures to be employed to protect the archaeological or cultural heritage environment during decommissioning works.

7. The planning authority and this Department shall be furnished with a final archaeological report describing the results of all archaeological monitoring and any archaeological investigative work/excavation required, following the completion of all archaeological work on site and any necessary post-excavation specialist analysis. All resulting and associated archaeological costs shall be borne by the developer.

Response

The potential for the presence of archaeological sites not listed in the SMR within the development site is noted in the **EIAR** and **Section 15.4.2** states the following:

While no surface features were noted in these areas [turbines and associated infrastructure] the potential does exist for the presence of subsurface archaeological sites, features or artefacts within their locations. As the existence, nature and extent of any unrecorded subsurface archaeological remains within the Site are unknown; the magnitude of potential impacts is indeterminable but ground works during the construction phase will have the potential to result in permanent, direct, adverse, moderate to significant effects on any unrecorded archaeological sites that may exist within the footprint of development areas that will be subject to ground excavation works, and this will require mitigation.

The mitigation measures detailed in the **EIAR (Section 15.5.1)** includes the following:

The locations of turbines and associated infrastructure within the boundary of the Site will be subject to a pre-construction geophysical survey, carried out by a suitably qualified consultancy, followed by a programme of archaeological test trenching which will be informed by the results of the geophysical survey. These site investigations will be carried out under licence by the National Monuments Service (NMS) of the Department of Housing, Local Government and Heritage. In the event that any sub-surface archaeological features are identified during these site investigations they will be recorded and then securely cordoned off while the NMS are consulted to determine further appropriate mitigation measures, which may include preservation in situ (by avoidance) or preservation by record (archaeological excavation) as well as monitoring of construction phase ground works within their environs.

The recommended DHLGH archaeological conditions 1, 2, 4, 5 6 and 7 detailed above will be complied with as part of the pre-construction, construction and decommissioning phases of the proposed Project. In relation to recommended Condition no. 3, the National Monuments Service and the LCCC Archaeologist will be consulted in relation to any potential design responses to result in the preservation in situ of newly identified potential archaeological sites at the sub-station, T06 and spoil storage area. This consultation will be informed by the results of advance geophysical surveys at these locations. In the event that preservation in situ of these potential sites is not feasible, they will be subject to Full Archaeological Excavation (licensed under the National Monuments Acts) as detailed in recommended Condition no. 3. The pre-construction archaeological site investigations

detailed in the above recommended conditions will be conducted well in advance of the commencement of the construction phase in order to allow sufficient time for the completion of onsite investigations, compilation of reports and consultations with the National Monuments Service and the LCCC Archaeologist in relation to any further mitigation measures required for any identified archaeological sites, i.e. preservation in situ (by avoidance) or preservation by record (licensed archaeological excavation).

Limerick City and County Council

The Limerick City and County Council (LCCC) Archaeologist's report note the presence of newly discovered archaeological sites within the proposed Project site which were identified by a local survey. While not cited in the report these are likely sites identified by Dr. Eugene Costello (see response to Bruree-Charleville-Effin Wind Farm Action Group submission). The LCCC Archaeologist's report includes the following recommended planning conditions:

Condition 1: The developer shall appoint a licensable archaeologist who shall apply for a licence to manage all archaeological mitigation required by the Planning Authority, inter alia to advise on all redesign, to monitor all site investigations, excavation works and all ground disturbance associated with the development, to carry out advance archaeological excavations. The name of the archaeologist shall be submitted within one month of the grant of planning permission or at any time before that date, accompanied by a site specific letter from the archaeologist certifying that they have applied for a licence.

Condition 2: Consultation with the Archaeological Survey of Ireland shall be undertaken to map all of the missing previously recorded sites, which consist of enclosures and ring ditches. Re-evaluation of the impact by the proposed Project on the setting of these monuments shall be undertaken.

Condition 3. Buffers of 25m shall be established from the outer known edge of all of the Recorded Monuments, and the known monuments. A revised drawing indicating these buffers shall be submitted for the approval of the Planning Authority. The drawing shall show the outer circumference of the individual site and a 25m buffer which mirrors this line which shall be annotated. The buffer shall be maintained in perpetuity and within it no deep rooted planting, landscaping, soil disturbance, or subsequent exempted development shall occur. The buffer shall be physically established prior to the commencement of construction and shall be a fence with driven post & rails with appropriate signage, and its construction shall be supervised & certified by the appointed archaeologist.

Condition 4: Within one month of the grant of planning permission, or before, as indicated in the submitted mitigation strategy, a licensed geophysical survey shall be undertaken across the entire site within Co. Limerick. The survey shall employ the system or a combination of systems of survey to amass the best results and the report shall lay out the reasons for this methodology. The results of this survey shall be reviewed by the Planning Authority. In the event that there are further definitively recognisable monuments established during the survey, redesign and buffer areas may be required.

Condition 5: In consultation with the Planning Authority a schedule of licensed archaeological test trenching, as indicated in the mitigation strategy, shall be undertaken, informed by the results of

the non-invasive geophysical survey but also including a representative sample of the site. The preliminary results of this archaeological test trenching shall be submitted to the Planning Authority on completion of site works. Further mitigation may be required at this point either redesign or advance excavation and this is to be agreed in consultation with the Planning Authority. The final report of the test trenching, in the format recommended in the Guidelines for Authors of Reports on Archaeological Excavations 2006 National Monuments Service shall be submitted within 6 months.

Condition 6: Following the survey & test trenching there may be a requirement for advance archaeological excavation if redesign is not an option or practicable. If enabling works have commenced on the overall site, then areas for advance excavation shall be fenced off with an adequate working buffer.

Condition 7: All areas requiring advance archaeological excavation shall be carried out well in advance of construction in that area. The developer shall provide satisfactory arrangements for the recording and excavation of any archaeological material that may be considered appropriate to excavate and shall undertake to complete all post excavation analysis up to and including final report stage. Excavators should include a catalogue of excavated features with 12 figure ITM coordinates for the centre point of each feature. Within twelve months of the completion of the excavation a final report (in the format recommended in the Guidelines for Authors of Reports on Archaeological Excavations 2006 National Monuments Service) shall be submitted to the Planning Authority

Condition 8: Licensed archaeological monitoring shall be in place for all ground disturbance associated with the development, this includes but is not limited to landscaping, tree planting, drainage, hardstand, access routes. Any private arrangements for construction compounds or storage that arise shall be assessed archaeologically and monitored.

Condition 9: The appointed archaeologist shall:

- a. Submit on completion of the ground works a report detailing the results of the licensed archaeological monitoring works to the Department of Housing, Local Government & Heritage and the Planning Authority. The report shall contain a drawing showing the exact extent of the area that was archaeologically monitored certified by the archaeologist. Excavators should include a catalogue of excavated features with 12 figure ITM coordinates for the centre point of each feature. In the event that the development is phased, interim reports shall be submitted at each stage showing the area monitored and giving preliminary results.
- b. Should archaeological material be found during the course of monitoring, the archaeologist may have work on the site stopped, pending a decision as to how best to deal with the archaeology. The Development Applications Unit, National Monuments Service, Department of Housing, Local Government & Heritage and the Planning Authority Archaeologist shall be informed immediately. The developer shall be prepared to be advised by the National Monuments Service, Department of Housing, Local Government & Heritage and the Planning Authority with regard to any necessary mitigating action.
- c. Should an archaeological excavation be required then the following shall apply: the developer shall provide satisfactory arrangements for the recording and excavation of any archaeological material that may be considered appropriate to excavate and shall undertake to complete all post excavation analysis up to and including final report stage. Excavators should include a catalogue of excavated features with 12 figure ITM coordinates for the

centre point of each feature. Within twelve months of the completion of the excavation a final report (in the format recommended in the Guidelines for Authors of Reports on Archaeological Excavations 2006 National Monuments Service) shall be submitted to the Planning Authority

Response

The potential for the presence of archaeological sites not listed in the SMR within the development site is noted in **Chapter 15** (Cultural Heritage) of the **EIAR** and **Section 15.4.2** states the following: *While no surface features were noted in these areas [turbines and associated infrastructure] the potential does exist for the presence of subsurface archaeological sites, features or artefacts within their locations. As the existence, nature and extent of any unrecorded subsurface archaeological remains within the Site are unknown; the magnitude of potential impacts is indeterminable but ground works during the construction phase will have the potential to result in permanent, direct, adverse, moderate to significant effects on any unrecorded archaeological sites that may exist within the footprint of development areas that will be subject to ground excavation works, and this will require mitigation.*

The archaeological mitigation measures detailed in the **EIAR (Section 15.5.1)** includes the following: *The locations of turbines and associated infrastructure within the boundary of the Site will be subject to a pre-construction geophysical survey, carried out by a suitably qualified consultancy, followed by a programme of archaeological test trenching which will be informed by the results of the geophysical survey. These site investigations will be carried out under licence by the National Monuments Service (NMS) of the Department of Housing, Local Government and Heritage. In the event that any sub-surface archaeological features are identified during these site investigations they will be recorded and then securely cordoned off while the NMS are consulted to determine further appropriate mitigation measures, which may include preservation in situ (by avoidance) or preservation by record (archaeological excavation) as well as monitoring of construction phase ground works within their environs.*

In relation to recommended Conditions 1 and 2, a licensable archaeologist will be appointed by the Developer to manage all required archaeological mitigation works as well as consultations with the LCCC Archaeologist, National Monuments Service and Archaeological Survey of Ireland. The name of the appointed archaeologist will be submitted within one month of a grant of planning.

In relation to recommended Condition no. 3, while EIAR mitigation proposed 20 m protective cordons, the Developer will adopt larger buffers where required by the planning conditions, for example 25 m as recommended by the LCCC Archaeologist, subject to confirmation of each monument's extent by geophysical survey and/or test excavation.

In relation to recommended Condition no. 4, a geophysical survey of development areas will be conducted following a grant of planning. It is noted that the licensing application period for geophysical surveys can often exceed 1 month and the LCCC Archaeologist will be kept apprised of the progress of this licence application following a grant of permission.

In relation to recommended Condition 5, a programme of archaeological test trenching will be carried out which will be informed by the results of the geophysical survey and will include a representative sample of the development.

In relation to recommended Conditions no. 6 and 7, the LCCC Archaeologist and National Monuments Service will be consulted in relation to the formulation of appropriate further mitigation measures for any archaeological sites or features identified during geophysical surveys and test trenching, i.e. preservation in situ (by avoidance) or preservation by record (by licensed archaeological excavation).

In relation to recommended Conditions 8 and 9, the appointed archaeologist will conduct monitoring of ground disturbance works. In the event that any archaeological material is identified during monitoring the appointed archaeologist will consult with the National Monuments Service and the LCCC Archaeologist in relation to appropriate mitigation measures, i.e. preservation in situ (by avoidance) or preservation by record (by licensed archaeological excavation).

Bruree-Charleville-Effin Wind Farm Action Group

This submission notes that the EIAR does not include an assessment of a number of archaeological sites identified in the area by Dr Eugene Costello between the end of 2023 and spring 2025. The submission also notes that these sites were reported to the Archaeological Survey of Ireland but have not been added to the National Monuments Service's online Historic Environment Viewer, which publishes their non-statutory Sites and Monuments Record database, as it has been frozen due to an IT problem in late 2023. These newly discovered sites include enclosures, ring ditches, a barrow and a ringfort and eight of these (referred to in the Bruree-Charleville-Effin Wind Farm Action Group submission as Sites 2-8 and 10) are located within the boundary of the proposed Project. The submission states that the proposed Project will impact on the following of those sites:

- Sub-station is planned on top of site no. 8 (a ring-ditch)
- Roadway between T8 and T7 will impact the northern part of site no. 2 (an enclosure)
- Roadway and T6 hardstand will impact the east of site no. 5 (an enclosure)
- Works around T9 hardstand will impact site no. 4 (a ring-ditch)
- Soil storage location will impact site no. 3 (an enclosure)

The submission also states that the archaeological inspections included field visits to some parts of the site when it was summertime with heavy vegetation (wild iris and tall grass) which is extremely inadvisable given the likelihood of such vegetation obscuring surface traces of archaeological sites.

Response

As noted in the submission, details on the recorded archaeological sites located within the study area reviewed in the Cultural Heritage chapter of the EIAR was based on the Sites and Monuments Record (SMR) as published on the National Monuments Service's Historic Environment Viewer (HEV). This included reviews of a number of archaeological sites within the study area, some of which were identified by Dr. Costello, which were added to the SMR in the period between 2021 and early 2023. As noted in the submission, eight archaeological sites were subsequently identified within the development boundary by Dr Costello. These sites had not been identified during surveys in the period between 2021 and early 2023 and, therefore, have not been added to the SMR dataset published on the HEV due to an IT issue.

A scoping letter in relation to the proposed Project was issued to the Department of Housing, Local Government and Heritage, via the Development Applications Unit, during the assessment process and no response was received in relation to any additional recorded archaeological sites located within the environs of the proposed Project. In addition, the EIAR Cultural Chapter includes details on a number of other previously unrecorded potential archaeological sites which were identified within the environs of the proposed Project during the EIAR assessment. These identified potential sites have been avoided by design and will be preserved in situ.

Based on a review of the locations of these sites, as identified in an appendix to the submission, the following is noted:

- Site 2 (enclosure) – the indicated location of this site is c.10m-15m to the south of the proposed site access track between T8 and T7
- Site 3 (enclosure) – the indicated location of this site is within the footprint of a proposed spoil retention area
- Site 4 (ring-ditch) – the indicated location of this site is c.20m to the south of the T9 hardstand
- Site 5 (enclosure) – the indicated location of this site is adjacent to the T6 hardstand and associated site access track
- Site 8 (ring ditch) – this site is located within the south end of the footprint of the proposed sub-station.

The proposed Project has the potential to result in direct impacts on three of the identified (Sites 3, 5 and 8). It is noted that these impacts were considered acceptable to the DHLGH whose submission contains a recommended planning condition for the Full Archaeological Excavation of these potential archaeological sites prior to construction. To address issues raised in observations, the Developer will commission an advance preliminary targeted geophysical survey of areas suitable for survey at these three potential archaeological sites in order to appraise their archaeological potential and the potential for preservation in situ. This appraisal will be carried out in consultation with the National Monuments Service and the LCCC Archaeologist and a report on this targeted geophysical survey will be submitted to the Planning Authority.

The potential for the presence of archaeological sites not listed in the SMR within the development site is noted in the **EIAR** and **Section 15.4.2** states the following:

While no surface features were noted in these areas [turbines and associated infrastructure] the potential does exist for the presence of subsurface archaeological sites, features or artefacts within their locations. As the existence, nature and extent of any unrecorded subsurface archaeological remains within the Site are unknown; the magnitude of potential impacts is indeterminable but ground works during the construction phase will have the potential to result in permanent, direct, adverse, moderate to significant effects on any unrecorded archaeological sites that may exist within the footprint of development areas that will be subject to ground excavation works, and this will require mitigation.

The mitigation measures detailed in the **EIAR (Section 15.5.1)** includes the following:

The locations of turbines and associated infrastructure within the boundary of the Site will be subject to a pre-construction geophysical survey, carried out by a suitably qualified consultancy, followed by a programme of archaeological test trenching which will be informed by the results of the geophysical survey. These site investigations will be carried out under licence by the National Monuments Service (NMS) of the Department of Housing, Local Government and Heritage. In the event that any

sub-surface archaeological features are identified during these site investigations they will be recorded and then securely cordoned off while the NMS are consulted to determine further appropriate mitigation measures, which may include preservation in situ (by avoidance) or preservation by record (archaeological excavation) as well as monitoring of construction phase ground works within their environs.

The above archaeological site investigations will be carried out to implement the EIAR mitigation measures, and to comply with relevant planning requirements, well in advance of the commencement of the construction phase in order to allow sufficient time for the completion of investigations, compilation of reports and consultations with the National Monuments Service and the LCCC Archaeologist in relation to the formulation of further mitigation measures for any identified archaeological sites.

In relation to the reference in the submission relating to archaeological site visits being carried out during summertime, it is stated in **Section 15.2.6** of the **EIAR** that archaeological site inspections were also conducted during the months of October 2022 and December 2024.

The Heritage Council

The Heritage Council submission notes that there is distinct possibility for the presence of further sites and features of archaeological interest at a prehistoric and later date. Some of these monuments may be within the construction area of the turbines, and if so, these will undergo irreversible significant damage. They recommend that a geophysical survey be undertaken on the footprint of the development and the adjacent area which is cross-referenced with LiDAR and other available data sources. From examination of the archaeological record of this area and what has been identified by the **EIAR (see Chapter 15, p44, LiDAR sites A-G)** there seems to be a complex of prehistoric monuments within the area of this proposed Project. There is also a strong likelihood of further unidentified archaeological material. It would therefore be prudent for a planning authority to assess this impact. Accordingly, further assessment of this complex needs to be undertaken.

Response

The potential for the presence of archaeological sites not listed in the SMR within the development site is noted in the **EIAR** and **Section 15.4.2** states the following:

While no surface features were noted in these areas [turbines and associated infrastructure] the potential does exist for the presence of subsurface archaeological sites, features or artefacts within their locations. As the existence, nature and extent of any unrecorded subsurface archaeological remains within the Site are unknown; the magnitude of potential impacts is indeterminable but ground works during the construction phase will have the potential to result in permanent, direct, adverse, moderate to significant effects on any unrecorded archaeological sites that may exist within the footprint of development areas that will be subject to ground excavation works, and this will require mitigation.

The mitigation measures detailed in the **EIAR (Section 15.5.1)** includes the following:

The locations of turbines and associated infrastructure within the boundary of the Site will be subject to a pre-construction geophysical survey, carried out by a suitably qualified consultancy, followed by a programme of archaeological test trenching which will be informed by the results of the geophysical survey. These site investigations will be carried out under licence by the National Monuments Service (NMS) of the Department of Housing, Local Government and Heritage. In the event that any

sub-surface archaeological features are identified during these site investigations they will be recorded and then securely cordoned off while the NMS are consulted to determine further appropriate mitigation measures, which may include preservation in situ (by avoidance) or preservation by record (archaeological excavation) as well as monitoring of construction phase ground works within their environs.

The developer will commission the above archaeological site investigations well in advance of the commencement of the construction phase in order to allow sufficient time for the completion of investigations, compilation of reports and consultations with the National Monuments Service and the Limerick City and County Council Archaeologist (LCCA) in relation to the formulation of appropriate further mitigation measures for any identified archaeological sites or features, i.e. preservation in situ (by avoidance) or preservation by record (by licensed archaeological excavation). This will include geophysical surveys of the location of the proposed Project.

An Taisce

An Taisce's submission notes the presence of a number of recorded archaeological sites within the environs of the proposed Project and recommends that the integrity of these sites requires preservation via a 20metre minimum buffer zone, between the development sites and these monuments. The submission also notes that it may be necessary for a further archaeological investigation and test to be carried out in advance of development consent determination, given the potential for further monuments and archaeological features of interest to be present throughout the site. This should not be left as a condition after the permission due to monitoring and enforcement constraints within planning authorities.

Response

In relation to buffer zones around recorded archaeological sites, the mitigation measures detailed in **Section 15.5.1** of the **EIAR** states the following:

Protective cordons extending for 20m from the outer edges of all known and potential archaeological sites within the boundary of the Site will also be securely delimited off with fencing and clearly signed as 'No Entry Areas' for the duration of the construction phase. No ground reduction works or other ancillary development works including, but not limited to, drainage/services, spoil storage, traffic/parking, compounds, or landscaping/planting, will occur within the archaeological exclusion areas and their locations will be identified during site inductions during the construction phase.

While the EIAR mitigation proposed 20 m protective cordons around recorded archaeological sites, the Developer will adopt larger buffers where required by planning conditions, for example 25 m as recommended by the LCCC Archaeologist, subject to confirmation of each monument's extent by geophysical survey and/or test excavation.

Section 15.5.1 of the **EIAR** also states that:

The locations of turbines and associated infrastructure within the boundary of the Site will be subject to a pre-construction geophysical survey, carried out by a suitably qualified consultancy, followed by a programme of archaeological test trenching which will be informed by the results of the geophysical survey. These site investigations will be carried out under licence by the National Monuments Service (NMS) of the Department of Housing, Local Government and Heritage.

In the event that any sub-surface archaeological features are identified during these site investigations they will be recorded and then securely cordoned off while the NMS are consulted to determine further appropriate mitigation measures, which may include preservation in situ (by avoidance) or preservation by record (archaeological excavation) as well as monitoring of construction phase ground works within their environs.

It is noted that the submissions by the LCCC Archaeologist and the National Monuments Service include recommended conditions for inclusion in a grant of planning which include geophysical survey and archaeological test trenching to be carried out in advance of the construction phase. The proposed Project has the potential to result in direct impacts on three potential archaeological sites (see response to Bruree-Charleville-Effin Wind Farm Action Group and DHLGH submissions). It is noted that the DHLGH submission also contains a recommended planning condition requiring the Full Archaeological Excavation of these three potential archaeological sites. The Developer will commission an advance preliminary targeted geophysical survey of areas suitable for survey at these three potential archaeological sites, in order to appraise their archaeological potential and their potential for preservation in situ. This appraisal will be carried out in consultation with the National Monuments Service and the LCCC Archaeologist. A report on this targeted geophysical survey and any proposed preservation in situ by design will be submitted to the Planning Authority.

APPENDIX 7

GARRANE GREEN ENERGY PROJECT
RESPONSE TO TRAFFIC AND TRANSPORT OBSERVATIONS
TO AN COMISIUN PLEANALA

GARRANE GREEN ENERGY PROJECT

1. INTRODUCTION

1.1 Brief

Jennings O'Donovan & Partners Limited has been appointed by Garrane Green Energy to prepare a response to Traffic and Transport observations on Garrane Green Energy Project to An Coimisiún Pleanála.

1.2 Statement of Authority

The response has been prepared by John Doogan of Jennings O'Donovan & Partners Limited, Finisklin Business Park, Sligo. Established in Sligo in 1950. Jennings O'Donovan & Partners Limited is a clean tech company providing consulting engineering services in the areas of renewable energy, civil and structural engineering, road design, water supply, wastewater collection and treatment, environmental resource management and impact assessment and in the area of housing and commercial development.

1.3 Proposed Project Site Location

The proposed Garrane Green Energy Project is located in County Limerick. The Project will consist of 9 No. wind turbines and associated works. The location of the proposed Garrane Green Energy Project showing the proposed permanent and temporary site entrances shown on **Figure 1**.

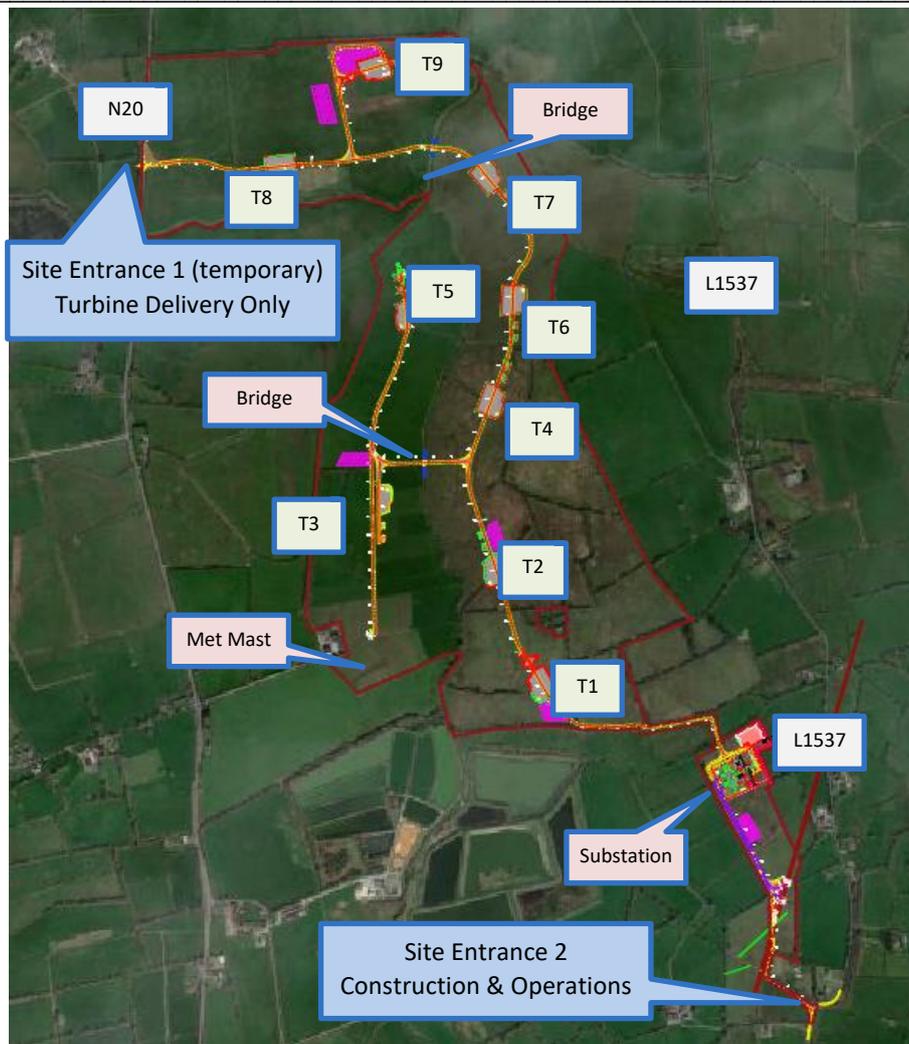


Figure 1 – Garrane Green Energy Project, Site Layout

RESPONSE TO TRAFFIC INFRASTRUCTURE IRELAND OBSERVATION

Reference TII25-133171. The TII observation addresses TII policy regarding access to the national road network, TII design standards, haul routes for abnormal load delivery, gross vehicle weights and seeks clarification regarding the proposed temporary site entrance on the N20.

2. ACCESS TO THE PROPOSED PROJECT

2.1 Transport Infrastructure Ireland Policy

The design and planning team for the Garrane Green Energy Project acknowledge TII policy outlined in Section 2.5 of the DoECLG, 2012 guidelines which seeks to avoid the creation of additional access points from new developments or the generation of increased traffic from existing non-public road accesses to the national road network. The permanent access point to the Garrane Green Energy Project is located on the L1537 local road as shown in **Figure 1**. During the operation of the wind farm there will be no direct access between the wind farm site and the N20. Following the completion of wind farm construction and turbine delivery, the temporary N20 junction shown in **Figure 1** will be reinstated to an agricultural access point as shown in **Figure 3**. The resulting agricultural access will have improved visibility splays of 215m in accordance with TII standards.

2.2 Temporary Site Entrance 1 – Operation and Reinstatement

Temporary Site Entrance 1 will be constructed as a temporary entrance for abnormal loads to access the Garrane Green Energy Project from the N20 national primary road. Site Entrance 1 will consist of a simple T-Junction located at an existing field entrance. The existing field entrance will be gated and will be isolated from the abnormal load entrance. The existing field entrance will remain operational for agricultural use and will not be available for construction, operation or decommissioning traffic. The field access will be upgraded as part of the Project, upgrades will include 215m visibility splays, 4m access track, bound surfacing at N20 intersection and field gate set back from the carriageway edge. Site Entrance 1 will only be used during delivery of abnormal loads such as turbine components, cranes and transformers and will not be used for general construction traffic. A temporary overrun area will be constructed at the junction to accommodate the swept path and wheel loading from abnormal load vehicles delivering turbine components during the turbine delivery phase of the project. When Site Entrance 1 is not in use for abnormal load deliveries, access to the junction will be restricted using temporary fencing erected along the existing N20 boundary. The temporary fencing will be used to restrict access and to prevent parking at the junction in the vicinity of the N20. The overrun area at the junction will be reinstated with topsoil and seeded with grass following the delivery of turbine components and the removal of cranes from the site. The layout of Site Entrance 1 during the construction phase of the Project is shown in **Figure 2**. During the operations phase of the project, Site entrance 1 will be closed and reinstated, operations traffic will access the Development via Site Access 2 on the L1537. Site Entrance 1 will have a dwell area with a gradient of -2.5% at its intersection with the N20 with drainage falling towards the Project and away from the N20 carriageway. Visibility at Site Entrance 1 will be in accordance with TII standards and will have visibility splays of 215m measured from the carriageway edge at a 3.0m setback distance. Details of temporary Site Entrance 1 during the construction of the Garrane Green Energy Project is shown in **Figure 2** and details of the reinstatement of temporary Site Entrance 1 is shown in **Figure 3**.

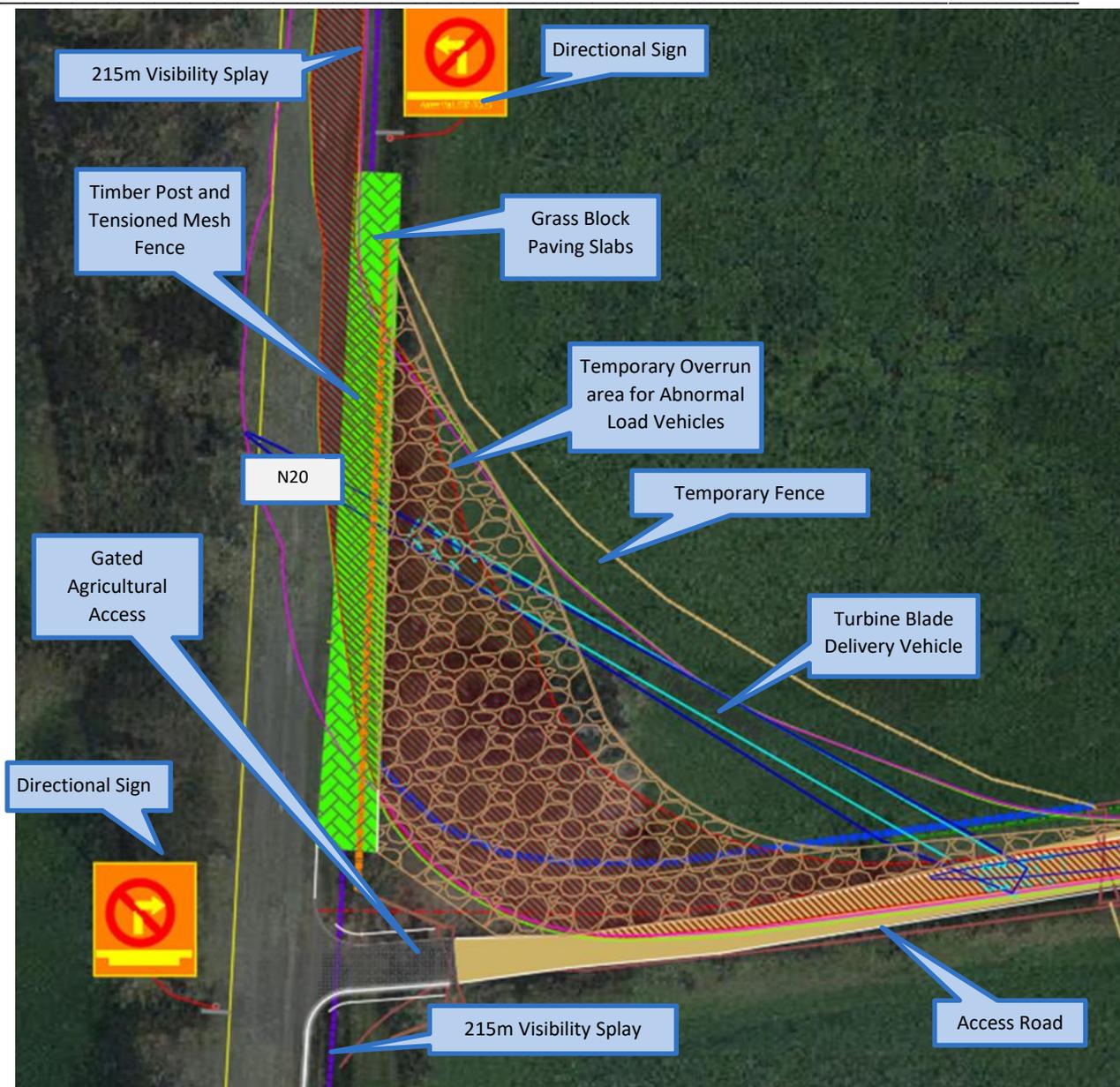


Figure 2 – Temporary Site Entrance 1 on the N20 – Construction Phase



Figure 3 – Temporary Site Entrance 1 on the N20 – Reinstatement / Operations Phase

It should be noted that Site Entrance 1 is for limited temporary use and its use is considered appropriate in the context of delivery of a renewable energy project.

2.3 Road Maintenance – National Roads

Prior to the commencement of works, the developer / contractor shall liaise with Transport Infrastructure Ireland (TII) and agree a protocol for general and emergency maintenance and repair of the national road network. The agreement will include call-out procedures for maintenance and repair of road surfacing at the site entrance on the N20 leading to the Garrane Green Energy Project and at locations on the turbine delivery route where enabling works are required. Specifications for materials and workmanship will be in accordance with TII standards and specifications which are published on the TII website. A pre-construction condition survey of the road network shall be carried out in order to establish an agreed baseline prior to any works commencing on site. A post construction road condition survey shall be carried out following the completion of construction to confirm that no deterioration has occurred on the road network.

2.4 Road safety audit

Temporary Site Entrance 1 from the N20 to the Garrane Green Energy Project has been subject to an independent Stage 1 road safety audit carried out in accordance with TII Guidelines GE-STY-01024 by an audit team approved by TII. The Stage 1 road safety audit has been submitted as part of the planning application. The recommendations arising from the Stage 1 road safety audit have been accepted by the design team and incorporated into the planning design.

2.5 Design Standards

All works on the national road network shall be carried out in accordance with TII standards and specifications which are published on the TII website.

2.6 Enabling Works – Materials, Specification and Reinstatement

The enabling works for transportation of turbines and reinstatement of road infrastructure on the public road network will be carried out in consultation with the relevant road stakeholders using an approved road opening licence and agreed traffic management plan which shall be in accordance with the Department of Transport Chapter 8 of the Traffic Signs Manual. Transport Infrastructure Ireland shall be included in all correspondence relating to proposed enabling and transportation of turbine components on the public road network. Specification of materials and workmanship shall be in accordance with TII publications and agreed with the relevant road stakeholders prior to any works being carried out on site. All damage to the national road network shall be repaired using materials and workmanship in accordance with TII specifications and shall be agreed prior to any works commencing on site.

2.7 Transportation of Abnormal Load Turbine Components on the Public road Network

The transportation of turbine components consisting of abnormal loads will be subject to abnormal load permits obtained by the haulier who will submit details of the transport vehicle, load to be transported and transport route to An Garda Síochána and to the local authority through which the load will pass. As is best industry practice, delivery vehicles shall use a combination of trailers and axle configurations based on the weight and dimensions of the load in order to ensure that the maximum axle weight transmitted to the road surface does not exceed the limits set out in the Road traffic Regulations, 2003. Prior to the transportation of turbine components between the port and the wind farm site, a trial run shall be carried out using a delivery vehicle using a retractable load gauge in order to determine that fully loaded vehicles can access the site. The trial run shall be carried out using appropriate permits in consultation with An Garda Síochána and all relevant road stakeholders. Transport Infrastructure Ireland and PPP operators shall be included in all correspondence relating to the transportation of turbine components.

3. STRUCTURES

3.1 Abnormal Loads

The transportation of substation and turbine components for the Garrane Green Energy Project will not result in gross vehicle weights exceeding 180 tonnes, and structures on the haul route with spans not exceeding 50m are not subject to a Category 3 structural assessment as defined in Section 1.3 of DN-STR-03001 published by TII for exceptional abnormal loads.

The transportation of turbine and substation components consisting of abnormal loads will be subject to abnormal load permits obtained by the haulage company who will submit details of the transport vehicle, load to be transported and transport route to An Garda Síochána and to the local authority through which the load will pass. As is best industry practice, delivery vehicles will use a combination of trailers and axle configurations based on the weight and dimensions of the load in order to ensure that the maximum axle weight transmitted to the road surface does not exceed the limits set out in the Road traffic Regulations, 2003. Prior to the transportation of turbine components, a trial run will be carried out by a delivery vehicle using a retractable load gauge in order to determine that fully loaded vehicles can access the Site. The trial run will be carried out using appropriate permits in consultation with An Garda Síochána, local authority and all relevant road stakeholders. Transport Infrastructure Ireland and PPP operators shall be included in all correspondence relating to the transportation of turbine components.

RESPONSE TO LIMERICK CITY AND COUNTY COUNCIL OBSERVATIONS

Below is a review of the recommended conditions put forward by the roads department of LCCC. We are broadly in agreement with the conditions, however there are some clarifications as set out below;

4. LIMERICK CITY AND COUNTY COUNCIL RECOMMENDED CONDITIONS, APPENDIX 1A

4.1 Condition 1(a) - Drawings

All drawings shall be agreed with Limerick City and County Council prior to any works commencing on site.

4.2 Condition 1(b I) – visibility - N20 Temporary Site Entrance 1

Visibility at temporary Site Entrance 1 on the N20 is shown on planning drawing 6839-JOD-GGE-XX-GR-C-0210 submitted as part of the planning application. Visibility at Site Entrance 1 is in accordance with Transport Infrastructure Ireland specifications DN-GEO-03060, Geometric Design of Junctions for a speed of 100km/h. Visibility splays of 215m measured at a 3.0m setback from the carriageway edge are provided at the junction. The existing boundary is to be set back at the entrance to allow uninterrupted visibility splays from temporary Site Entrance 1 and from the adjacent agricultural access. Drawings showing the Limerick City and County Council visibility requirement of 215m measured from a 4m setback from the carriageway edge and boundary setback requirements will be submitted to Limerick City and County Council for approval prior to any works commencing on site.

4.3 Condition 1(b II)– visibility - Site Entrance 2

Visibility at Site Entrance 2 on the L1537 is shown on planning drawing 6839-JOD-GGE-XX-GR-C-0211 submitted as part of the planning application. Visibility splays of 90m to the right and 70m to the left measured at a 3.0m setback from the carriageway edge are provided at the junction. A dedicated speed survey was undertaken on the approach to the entrance location and the proposed visibility splays correspond to stopping sight distances for vehicle speeds measured during the speed survey. Details of the speed survey and the calculated visibility splays are set out in **EIAR Appendix 17.1 Section 2.2**. Drawings showing the Limerick City and County Council visibility requirements measured from a 2.4m setback from

the carriageway edge and boundary setback requirements will be submitted to Limerick City and County Council for approval prior to any works commencing on site.

4.4 Condition 1(bIII) – Landowner Agreements

Documentation relating to landownership and landowner agreements has been submitted as part of the planning application. Documentation will be submitted to Limerick City and County Council for inspection prior to any works commencing on site.

4.5 Condition 1(bIV) - Road Safety Audit

Temporary Site Entrance 1 from the N20 to the Garrane Green Energy Project has been subject to an independent Stage 1 road safety audit carried out in accordance with TII Guidelines GE-STY-01024 by an audit team approved by TII. The Stage 1 road safety audit has been submitted as part of the planning application. The recommendations arising from the Stage 1 road safety audit have been accepted by the design team and incorporated into the planning design. A stage 1/2 road safety audit shall be carried out for Site Entrance 1 and Site Entrance 2 by TII approved auditors who are independent of the design team prior to any works commencing on site. The findings of the audit shall be submitted to Limerick City and County Council.

4.6 Condition 1(b V) - Stage 3 Road Safety Audit

A stage 3 road safety audit shall be carried out for the Garrane Green Energy Project prior to the commencement of the operational phase of the Development. The Stage 3 road safety audit will be carried out in accordance with TII Guidelines GE-STY-01024 by an independent audit team approved by TII. The findings of the stage 3 road safety audit shall be submitted to Limerick City and County Council for approval.

4.7 Condition 1(bVI) Road Safety Audit

The recommendations arising from the Stage 1 road safety audit carried out as part of the planning application for temporary Site Entrance 1 on the N20 have been accepted by the design team and incorporated into the planning design. Recommendations arising from future stage 1/2 and stage 3 audits requested by Limerick City and County Council will be incorporated into the design and agreed with Limerick City and County Council.

4.8 Condition 1(c) Abnormal Loads

The transportation of turbine components consisting of abnormal loads will be subject to abnormal load permits obtained by the haulier who will submit details of the transport vehicle, load to be transported and transport route to An Garda Síochána, Limerick City and County Council and to any local authority through which the load will pass. Delivery vehicles shall use a combination of trailers and axle configurations based on the weight and dimensions of the load in order to ensure that the maximum axle weight transmitted to the road surface does not exceed the limits set out in the Road traffic Regulations, 2003. Prior to the transportation of turbine components between the port and the wind farm site, a trial run shall be carried out using a delivery vehicle using a retractable load gauge in order to determine that fully loaded vehicles can access the site. The trial run shall be carried out using appropriate permits in consultation with An Garda Síochána and all relevant road stakeholders. Limerick City and County Council, Transport Infrastructure Ireland and PPP operators shall be included in all

correspondence relating to the transportation of turbine components. A preliminary traffic management plan (TMP) and turbine delivery route assessment (TDR) have been submitted with the planning application. The TMP and TDR provide details of enabling works required on the turbine delivery route for the transportation of abnormal loads.

4.9 Condition 1(d) - Enabling works on the Turbine Delivery Route

A preliminary traffic management plan (TMP) and turbine delivery route assessment (TDR) has been submitted with the planning application. The TMP and TDR provide details of enabling works required at junctions and pinch points on the turbine delivery route for the transportation of abnormal loads. The enabling works for transportation of turbines and reinstatement of road infrastructure on the public road network will be carried out in consultation with Limerick City and County Council and the relevant road stakeholders using an approved road opening licence and agreed traffic management plan which shall be in accordance with the Department of Transport Chapter 8 of the Traffic Signs Manual. Limerick City and County Council and Transport Infrastructure Ireland shall be included in all correspondence relating to proposed enabling works and transportation of turbine components on the public road network. Specification of materials and workmanship shall be in accordance with TII publications and agreed with the relevant road stakeholders prior to any works being carried out on site. All damage to the national, regional and local road network shall be repaired using materials and workmanship in accordance with Limerick City and County Council and TII specifications and shall be agreed prior to any works commencing on site.

4.10 Condition 1(e) - Road Condition Surveys and Maintenance

Prior to the commencement of works, the developer / contractor shall liaise with Limerick City and County Council and Transport Infrastructure Ireland (TII) and agree a protocol for general and emergency maintenance and repair of the national, regional and local road network. The agreement will include call-out procedures for maintenance and repair of road surfacing at the site entrances, haul routes and at locations on the turbine delivery route where enabling works are required. Specifications for materials and workmanship will be in accordance with Limerick City and County Council and TII standards and specifications. A pre-construction condition survey of the road network and bridges shall be carried out to establish an agreed baseline prior to any works commencing on site. A post construction road condition survey shall be carried out following the completion of construction to determine if deterioration has occurred on the road network. The extent of the road condition and bridge survey shall be agreed with Limerick City and County Council. The transportation of substation and turbine components for the Garrane Green Energy Project will not result in gross vehicle weights exceeding 180 tonnes and structures on the haul route with spans not exceeding 50m are not subject to a Category 3 structural assessment as defined in Section 1.3 of DN-STR-03001 published by TII for exceptional abnormal loads.

4.11 Condition 1(f) - Temporary Traffic Management Plan

A preliminary traffic management plan (TMP) has been submitted with the planning application for the Garrane Green Energy Project. A site-specific Temporary Traffic Management Plan (TTMP) shall be submitted to Limerick City and County Council for approval prior to the commencement of any works on site.

4.12 Condition 1(g) Grid Connection

The grid connection works for the Garrane Green Energy Project will be carried out within the boundary of the Development and no grid connection works will be carried out on the public road network.

4.13 Condition 2(a) and 2(b)

A pre-construction condition survey of the road network and bridges shall be carried out to establish an agreed baseline prior to any works commencing on site. A post construction road condition survey shall be carried out following the completion of construction to determine if deterioration has occurred on the road network. The extent of the road condition and bridge survey shall be agreed with Limerick City and County Council. The transportation of substation and turbine components for the Garrane Green Energy Project will not result in gross vehicle weights exceeding 180 tonnes and structures on the haul route with spans not exceeding 50m are not subject to a Category 3 structural assessment as defined in Section 1.3 of DN-STR-03001 published by TII for exceptional abnormal loads.

4.14 Condition 4(a I) – Working hours

Working hours shall be agreed with Limerick City and County Council.

4.15 Condition 4(a II) – Working hours

All surface water shall fall towards the site and will be incorporated into the site drainage network.

4.16 Condition 4(a III) – Staff Parking

Parking for staff will be provided at site compounds within the site, no parking will be permitted on the public roads or adjacent to site entrances.

4.17 Condition 4(a IV) – Deliveries

Deliveries to site shall be scheduled to avoid peak periods on the public road network. Deliveries of turbine components using abnormal load vehicles shall be carried out at times agreed with Limerick City and County Council and An Garda Siochana.

4.18 Condition 4(a V) – Stacking of vehicles

Parking for staff will be provided at site compounds within the site, no parking will be permitted on the public roads or adjacent to site entrances.

4.19 Condition 4 (b) – Wheel Cleaning

Wheel and vehicle cleaning facilities shall be provided at site entrances to prevent the spread of debris onto the public road network.

4.20 Condition 4 (c) – Temporary Traffic Management Plan

A preliminary traffic management plan (TMP) has been submitted with the planning application for the Garrane Green Energy Project. A site-specific Temporary Traffic Management Plan (TTMP) shall be submitted to Limerick City and County Council for approval prior to the commencement of any works on site.

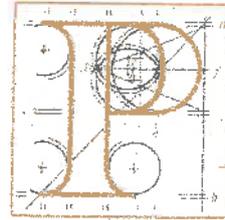
RESPONSE TO THIRD PARTY OBSERVATIONS

A number of the submissions raised concerns about the traffic and transport impact on the local road, national road network and on settlements in the vicinity of the Project. These have been comprehensively dealt with within the **EIAR Chapter 17** Traffic and Transport and its appendices (17.1-17.7).

There were specific concerns raised about impact on the road structure of the local road network and structural assessments of bridges. Again, these have been address in the EIAR, however as a matter of clarification, we can point to **EIAR Chapter 17, Section 17.4 Mitigation Measures**, the Developer has committed to carrying out *“A condition survey of the road network in the vicinity of the site entrances will be carried out and agreed with Limerick City and County Council prior to any works being carried out on site.”* A structural assessment was carried out on Garroose bridge as it is listed on the National Inventory of Architectural Heritage (NIAH 21904703) and is on the proposed Haul Route for materials. Due to the proximity to the proposed site entrance 2 and proposed traffic volumes, an inspection and structural assessment on the bridge was undertaken, this is included in **EIAR Appendix 17.7**. The assessment concludes that *“the triple arch bridge is currently in a relatively good structural condition. Our assessment indicates that the bridge is capable carrying the loads exerted on it by standard roadworthy vehicles.”*

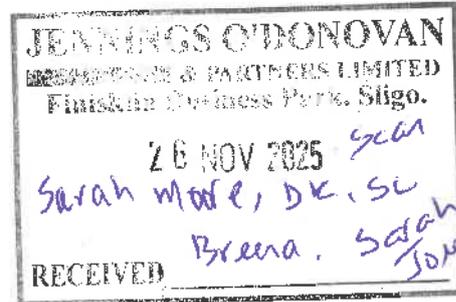
Our Case Number: ACP-323635-25

Your Reference: Garrane Green Energy Limited



An
Coimisiún
Pleanála

Jennings O'Donovan & Partners Limited
Finisklin Business Park
Finisklin
Sligo
Co. Sligo
F91 RHH9



Date: 25 November 2025

Re: 9 no. wind turbines, grid connection and all associated site works located in the townlands of Garrane, Ballynagoul, Creggane and Charleville, Co. Limerick. (www.garranegreenenergyplanning.ie)

Dear Sir / Madam,

Enclosed is a copy of 71 submissions received by the Commission from the following in relation to the above-mentioned proposed development:

Customer
Aileen Browne
Alan Mee
An Taisce
Andrew & Breeda Cussen
Andy O'Mahony
Anita Toner
Anne Walsh
Brendan and Mary Mc Kiernan
Brendan Hogan
Brian Morrissey
Brigid Teefy
Bruff Dromin Athlacca Ballinlee Community Action Group
Bruree-Charleville-Effin Wind Farm Action Group
Catherine & Kieron Selley
Catherine Lynch
Conor Fitzgerald
Darragh Walsh

Teil	Tel	(01) 858 8100
Glaao Áitiúil	LoCall	1800 275 175
Facs	Fax	(01) 872 2684
Láithreán Gréasáin	Website	www.pleanala.ie
Ríomhphost	Email	communications@pleanala.ie

64 Sráid Macilbhríde	64 Marlborough Street
Baile Átha Cliath 1	Dublin 1
D01 V902	D01 V902

Darren Maloney
 Deirdre Costello
 Denis J Morrissey & Brid Egan
 Denis O'Gorman and others
 Department of Defence
 Department of Housing, Local Government and Heritage
 Des Fitzgerald
 Dessie Fitzgerald
 Dolores Scannell
 Dr. Maiken Hemme Bro-Jørgensen
 Eco Advocacy
 Elizabeth Casey Chrysostomou
 Environmental Trust Ireland
 Eugene and Mary O'Shea
 Failte Ireland
 Frank Finn and others
 Frank Kelly
 Friends of the Irish Environment
 Geraldine Fitzgerald
 Gerard Cussen
 Helen & Olivier Lefebvre
 Helen Daly
 HSE National Environmental Health Service
 Ian Doyle
 Irish Aviation Authority
 Jacqueline & Kieran O'Rourke
 James Collins
 Joe and Sheila Morrissey
 Joe Foley
 John and Marie O'Brien
 John O'Donoghue
 Julianne Stokes
 Kevin and Kay Cagney
 Limerick City and County Council
 Maigne Rivers Trust
 Mairead Costello
 Marie-Clare Power & John Richmond
 Maurice O'Connor
 Michael Costello
 Michael Ryan
 Micheal Lyons and Others
 Morgan Lyons & Colette Hawe
 Niamh Costello
 Niamh Kelleher

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Office of Public Works

Owen Culhane

Pat McEnery and Family

Richard O'Donoghue

Senator Joanne Collins & Cllr PJ Carey

Shannon Airport Authority DAC

Siobhan & Mike Sexton

The Heritage Council

Transport Infrastructure Ireland

Uisce Éireann

The Commission hereby considers it appropriate to invite you to make a submission on the observations received in relation to the application. Please be advised that any response to the Commission's invitation should not contain any additional reports or supplementary reports and should be confined to the issues raised in the observations received by the Commission. Any submission in relation to the above must be received by the Commission within 8 weeks from the date of this letter (i.e. not later than the 20th of January, 2026).

If you have any queries in relation to the matter please contact the undersigned officer of the Commission.

Please quote the above mentioned An Coimisiún Pleanála reference number in any correspondence or telephone contact with the Commission.

Yours faithfully,


Honor Saïo Marren
Executive Officer
Direct Line: 01-8049315

PA08

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