Report to Inspector (Appendix to main report) ABP- 309770-21

Development	Coole Windfarm: proposed development of 15 wind turbines with a tip height of up to 175 metres and laying of approximately 26km of underground electricity cable to facilitate the connection to the national grid, and all associated site development works
Location	Townlands of Camagh, Carlanstown, Coole, Clonrobert, Clonsura, Doon, Monktown, Mullagh, Newcastle and other townlands, Co. Westmeath.
Type of Application	Strategic Infrastructure Development
Topic: **Biodiversity and** **Appropriate Assessment**	Response by applicant to An Bord Pleanála request for further information and adequateness of information for purpose of Appropriate Assessment and Ecological impact assessment (EIAR Chapter 6 Biodiversity and Chapter 7 Ornithology)
Site visit	25th February 2023
Inspectorate Ecologist	Dr Maeve Flynn BSc. PhD. MCIEEM
Planning Inspector	Mairead Kenny

Contents

1.0 Introduction

Background

1.1. The Strategic Infrastructure Development (SID) application for planning permission for the Coole Windfarm is accompanied by an Environmental Impact Assessment Report (EIAR) prepared by MKO Planning and Environmental Consultants, Chapter 6 of which comprises an assessment of effects on Biodiversity and Chapter 7 on Ornithology (birds). A Natura Impact Statement (NIS) has also been submitted with the application to inform Appropriate Assessment (AA).

1.2. The Development Applications Unit (DAU) coordinated a detailed submission on nature conservation on behalf of the National Parks and Wildlife Service (NPWS) of the Department of Housing, Local Government and Heritage (DHLGH). The submission identified issues of significance in relation to the Natura Impact Statement and the EIAR.

1.3. An Bord Pleanála requested the applicant to submit further information on a number of topics (21 April 2022) including a detailed response to the DHLGH submission in relation to the NIS, biodiversity, including ornithology, soils and geology interactions with peat harvesting. The relevant requests are reproduced here:

> **Natura Impact Statement**
>
> Clarification is required in relation to the appendices associated with the NIS as there is a lack of consistency between the information submitted under the different formats. In addition, the applicant is requested to consider whether all application documents relevant to the assessment of special conservation interests and related mitigation and monitoring should be attached as appendices to the NIS.
>
> Observations made by the Department of Housing, Local Government and Heritage (DAU, 17th May 2021) on nature conservation identify gaps in the survey information and assessments presented in the Screening for appropriate assessment and the Natura Impact Statement (NIS). You are

requested to address **all points** made by the Department in their submission as part of a revised screening report and NIS.

In particular, the Board seeks clarity on the extent of coverage of the site during bird surveys conducted between 2015 and 2020 noting also the gap in viewshed of the vantage points utilised. Further scientific justification is required in relation to the absence of bird migratory routes over the site or the crossing of the site by birds moving between SPA sites as outlined by the Department. In line with the Departments submission, you are requested to re-consider the screening exercise and the exclusion of Special Conservation Interest (SCI) species including Greenland white-fronted geese.

The scientific information provided as part of an NIS to inform Appropriate Assessment and as part of the EIAR should be based on up-to-date ecological reports and data. You are requested to give careful consideration to which, if any surveys need to be updated based on CIEEM (2019) Advice note on the lifespan of ecological reports and surveys[1] and taking account of the concerns raised by the Department. Survey data and analysis should be updated with any ongoing survey data that may have been collected since 2020.

The assessment should include consideration of in combination effects with ongoing peat harvesting and any future rehabilitation plans during the operation lifespan of the proposed development. The potential for any peatland habitat rehabilitation to provide enhanced habitats for wintering and breeding birds within the sites should be considered. Updated aquatic survey for some parameters at least may be required to address the request for a detailed assessment of the water quality parameters required for the River

[1] https://cieem.net/wp-content/uploads/2019/04/Advice-Note.pdf

Inny and Lough Derravarragh SPA in order to assess in combination effects of peat harvesting with the proposed development.

Biodiversity (EIAR)

Observations made by the Department Housing, Local Government and Heritage on nature conservation identify gaps in the survey information and assessments presented in the Biodiversity chapter of the EIAR. You are requested to address **all points** made by the Department in their submission as part of the request for further information.

In particular the Board seeks further information on the impacts on bird species in terms of the concerns raised by the Department. As outlined, this may require consideration of additional survey and analysis.

1.4. The applicant submitted a detailed response to the request for further information (dated October 2022- received 1st Nov 2022). The response documents were prepared by MKO Planning and Environmental consultants and included:

- Response to further information request (including appendices)
- Revised Natura impact statement including screening for AA and appendices.

A public consultation period on the additional information ran from 20th January 2023 for 5 weeks.

Scope of 'Report to Inspector'

1.5. As part of my role as Inspectorate Ecologist, I was requested to examine and evaluate the Applicants response to the request for further information in relation to nature conservation issues. I visited the proposed Coole Windfarm site on the 25th of February 2023 as part of my evaluation.

1.6. This report to the Inspector and available to the Board is a written record of my review and evaluation of the submitted information as it relates to biodiversity including ornithology and Appropriate Assessment (AA), taking account of the nature

conservation observations/ recommendations of DHLGH/NPWS in particular and public submissions. This report does not comprise the AA, rather it is a professional opinion as to the adequateness of the information for the purpose of AA and for the biodiversity impact assessment.

1.7. I have examined the following documents including relevant drawings (plans and particulars):

- NIS and revised NIS including screening report and all appendices.
- EIAR: Chapter 6 Biodiversity and Chapter 7 Ornithology and related appendices
- Aquatic assessment reports
- Additional bird report- surveys
- Bat survey report
- Invasive species
- Construction and Environmental Management Plan
- Response to further Information Request (Combined response document)
- EIAR chapters and associated appendices with biodiversity interactions including Chapter 8 Land, soils and geology, Chapter 9 Water (hydrology and hydrogeology), Chapter 15 interactions, Chapter16 Schedule of Mitigation and Monitoring

1.8. The documents have been reviewed with respect to the following current best practice guidance:

- CIEEM (2019) Ecological Impact Assessment Checklist (see attached-as relevant to Irish legislation)
- DoEHLG (2009). Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities. Department of the Environment, Heritage and Local Government, National Parks and Wildlife Service. Dublin
- EC (2018) Managing Natura 2000 sites. The provisions of Article 6 of the Habitats Directive 92/43/EEC

- EC (2021) Assessment of plans and projects in relation to Natura 2000 sites. Methodological guidance on Article 6(3) and 6(4) of the Habitats Directive 92/43/EC
- NatureScot (formerly Scottish Natural Heritage) publications on wind farm impacts on birds (https://www.nature.scot/professional-advice/planning-and-development/planning-and-development-advice/renewable-energy/onshore-wind-energy/wind-farm-impacts-birds)

2.0 Proposed Development

2.1. A full and detailed description of the development is presented in the EIAR and NIS and summarised in the Inspectors Report. The 15-turbine wind farm is proposed for an area that has been utilised for peat harvesting. The proposed development would also include new site access roads, an onsite substation, construction of a link road to facilitate turbine delivery, a 26km underground electricity cable installed along existing roads to connect with Mullingar 110kV substation, excavation of a borrow pit, site drainage, forestry felling and all associated site development works.

2.2. Located 2.4 km north of Coole village, the windfarm site itself is not within or immediately adjacent to any European Sites, Special Area of Conservation (SAC) or Special Protection Area (SPA) or Natural Heritage Sites (NHA). The proposed underground cable route does come in close proximity to Lough Derravarragh SPA and Lough Owel SPA at certain points, for example along the N4.

2.3. As part of the further information submitted, it was confirmed that design and range of turbine specifications would be a ground to blade tip height of 175m, with a blade length range of 74.5-77.5m and a maximum hub height in the range of 97.5-100.5m. I note that the full range of possible turbine dimensions were assessed as three separate bird collision risk assessments (maximum height of 175 with three rotor diameter possibilities giving ground clearance of 20-26m).

2.4. Mitigation measures have been integrated into the design of the proposed development through the principles of avoidance of impacts and reduction of impacts where avoidance is not possible. Where the potential for any adverse effect on a European Site was identified, it is stated that the pathway by which such effects could occur will be blocked by avoidance, design and mitigation measures set out for the construction and operation of the proposed development.

2.5. The majority of the peatland site is outside of the redline boundary of the planning application. The applicant states that the proposed development has been assessed based on a worst-case scenario that peat harvesting will continue. There remains uncertainty as to the future management of the exploited peatland (cut over raised bog) that surrounds the proposed turbine layout at the windfarm site, whether there will be further peat harvested or what the ongoing management or rehabilitation of the area will entail. The applicant states that an Interactions Management Group comprised of Coole wind farm Ltd, and all relevant landowners and tenants will be set up to manage the exploited peatland in the future. It is stated that any future rehabilitation works would be subject to its own assessment and would have to consider the windfarm as part of a cumulative assessment.

3.0 Further information request and response

In this section, I consider the submissions and observations that related to AA and biodiversity and ornithology that informed the request for further information and summarise how these were considered by the applicant. I provide further analysis of key issues in sections 5 and 6 of this report.

Submissions and Observations on Planning Application

3.1. Statutory

Development Applications Unit (DAU) co-ordinated a detailed submission from the Department of Housing, Local government and Heritage. I have summarised the issues raised in Table 1. The submission concluded with the following:

> *The Department would like to highlight that the conclusions of any AA must be certain with the assessment based on the best available scientific evidence and containing no lacunae. In relation to the current proposal, it is the view of this Department that this is not possible, based on the information currently available and lacunae in the screening for AA, the NIS and EIAR to exclude to likelihood of negative impacts of the project for the conservation objectives of European Sites and biodiversity in general.*

Table 1. Summary of DHLGH observations relation to Appropriate Assessment and consideration by applicant as part of further information submitted.

Matters relating to Appropriate Assessment (AA)	
Observations of DHLGH/ NPWS	**Consideration by Applicant in FI** (Summary from Response document)
Screening for AA Procedure questioned: • Screening out of certain QI and SCI not recommended- sites should be taken forward for AA • Should SPA sites >15km have been considered? • Scientific rationale for excluding SPAs in the screening for AA- limitations of guidance used should be acknowledged. • Greenland white-fronted goose was excluded from further assessment- movements between sites? Screening should be reassessed for SCI of European Sites in proximity to the development. Scientific evidence of area not being within an identifiable migration route required.	Revised AA screening report (Appendix 4) All QI and SCI from sites screened in and considered in NIS. Rationale for screening SPA sites set out in revised AA Screening report. Lough Iron SPA and Garriskill Bog SPA considered in revised NIS (for Greenland white-fronted goose) Updated bird survey data submitted
Evaluation: The applicant has addressed all issues raised in relation to the screening report for AA. See Section 5.1 of this report	
NIS -general NIS deficient in not assessing all the QI/SCI for sites which have been screened in	All points addressed in revised NIS

SCI species cannot be excluded from assessment of the Wetland and Waterbirds habitat is screened in for AA. Incorrect QI listed for Lough Ennell SAC	
Site description: Proximity of turbines to watercourses Unclear if peat harvesting will continue or area will be rehabilitated- clarification required	All major infrastructure including turbines 50m from watercourses and 10m from large drainage channels. Peat harvesting /future site management issue remains uncertain. Interactions management group comprised of Coole wind farm Ltd and all relevant landowners and tenants will be set up to manage exploited peatland- (not assessed as part of EIAR or NIS)
Surveys: Aquatic survey (2016) out of date Up to date information from all vantage points (VP) locations, gap in viewshed, nocturnal bird surveys not conducted.	Aquatic survey updated (Triturus). Bird surveys updated with more recent data (Appendix 5). Viewshed analysis defended. (Nocturnal surveys not undertaken)
Desktop study:	Updated in revised NIS

Requirement to assess all identified impacts against QI and SCI of SAC and SPAs included in assessment	
EPA river catchments and watercourses: Rivers Inny and Glore listed as *at risk* by EPA in vicinity of proposed development. Assessment of data in view of conservation objectives to determine to mitigation used by peat harvesting and proposed development will be effective in preventing or reducing impacts to European sites. Decrease in SCI species using Lough Derravarragh	Considered in revised NIS See also section 9.3 Hydrology (appended to NIS)
SCI species Greenland white fronted goose excluded from AA and mitigation. Whooper swan- impacts to family groups, effectiveness of mitigation for this species- timing of operations and mitigation to reduce collision mortality	Greenland white-fronted Goose included and assessed in revised NIS (including collision model) Further survey and assessment – included Whooper swan
Assessment of potential effects and mitigation- Lack of nocturnal surveys Impacts from lighting on SCI species Mitigation measures for each QI habitat and species Mitigation measures for drainage should be clearly identified on maps Should be no uncertainty as to implementation of measures Clarification on piling requirements	Issues addressed in revised NIS

Assessment of residual adverse effects: Mitigation measures should be designed so that targets for site specific conservation objectives (SCCO) for each QI/SCI will not be exceeded during construction or operation Further assessment on Whooper swan community and foraging range (Lough Derravarragh SPA) Lough Iron and connections for Greenland white-fronted geese?	Issues considered in revised NIS
Invasive species Management should be in line with best practice guidance and licencing requirements	Management plan submitted. Revised NIS updated (Section 6.7)
In-combination effects- greater detail required including map, assessment of barrier effect to SCI species, assessment of existing peat harvesting on the site	In combination effects considered in NIS Assessment based on worst case of peat harvesting continuing.
Evaluation The applicant has addressed most issues raised in relation to the NIS. Uncertainty remains regarding the future land use and rehabilitation of the exploited peatland site at the windfarm. See Section 5.4 of this report. Note: DHLGH did not submit observations on the Further Information received	

Table 2: Summary of DHLGH observations relation to EIAR (biodiversity and ornithology) and consideration by applicant as part of further information submitted.

Matters related to Environmental Impact Assessment Report (EIAR)	
Observations of Department	**Consideration by Applicant**

Peat stability- Concerns regarding depths and proximity to water courses at certain locations including pNHA site Lough Bane	Peat stability report submitted Peat depths re-measured and revised Clarifications on distances between turbine locations, drainage channels and watercourses including Lough Bane pNHA
Fauna: Mammals- clarification on any main setts for Badgers and records of Otter ensure that requirements of regulation 51 of EC Regulations 2011 are satisfied. Bats- acknowledgement of potential impacts and mitigation measures recommended	Section 2.5 FI Appendix 13 of FI- updated mammal signs mapped. Pre-commencement survey to ensure no change in baseline and in line with legislation Recommendations on bats accepted
Birds: ensure data is up to date (e.g. woodcock) Buzzard, lapwing- further collision analysis required over winter and breeding seasons. Survey data insufficient for red listed birds of conservation concern e.g. Meadow pippet Golden plover, Peregrine falcon- impacts could be significant	Updated bird survey provided and included in analysis in revised NIS Collision risk model updated No flying Lapwing observed within the windfarm site during breeding season survey- collision analysis undertaken for winter season only. Passerines stated as generally not impacted significantly by windfarms (i.e. not assessed) Revised avoidance rate calculated for Golden Plover (Appendix 2 of Bird Survey Report: March 2021-March 2022)

Biodiversity net loss- National Biodiversity Action Plan-how will project avoid a net loss of biodiversity?	EIAR conclusion: development will not result in any significant effects on biodiversity. (**Note this is not the same as no net loss of biodiversity**)
Evaluation The applicant has addressed most issues raised in relation to the biodiversity assessment as part of the Further Information submitted. Uncertainty remains regarding the future land use and rehabilitation of the exploited peatland site at the windfarm. See section 6 of this report. Note: DHLGH did not submit observations on the Further Information received	

Public submissions:

3.2. A number of public submissions on the planning application for the proposed windfarm raised issues related to nature conservation and biodiversity. The submissions and applicants response are summarised in Table 3. There is some overlap between points raised in relation to European Sites /AA and general biodiversity and ecology. Where a submission was made on further information submitted, this is identified by (FI). A general response is provided in section 2.6.1.3.2 Biodiversity of the Further information document and addressed in the detailed responses to DAU provided. The applicant submitted a response to these observations on the further information, dated 4th May 2023.

Table 3. **Summary of public submissions/observations relation to EIAR (biodiversity and ornithology) and Further information**

Matters related to Appropriate Assessment	
Submissions	**Consideration by Applicant**
Impacts on sites designated for nature conservation	Revised Aa Screening and NIS

Mitigation measures and peat harvesting drainage and effects on water quality of European sites. (FI)	Revised NIS and FI document
Impacts on water quality of Rivers Inny and Glor and Lough Derravarragh and Lough Sheelin from removal and storage of peat (FI)	2.2.5 Hydrology- Response to Observations
Matters related to Environmental Impact Assessment Report (EIAR)	
Ornithology	
Impacts on birds including interrupting flight paths, bird collisions, Whooper swans,	Further information report, Revised NIS and EIAR Ornithology Chapter 7
Local knowledge of other birds including Barn owl and Long eared owls (Clonrobert),	Owl species referenced in EIAR Ornithology Chapter 7 also response to observations document
Reliance on scientific papers considered out of date- e.g. Percival 2003[2]	Additional surveys conducted and revised collision risk models
Changes to peatland since harvesting stopped including increase in skylarks, lapwing, cuckoo, cranes, and ducks.	Not addressed by applicant
Concerns regarding post construction monitoring and use of dogs,	Not specifically addressed
Question use of Band Model for estimating bird collisions. (Reference to D. Christie and B. Urquhart; New Zealand journal of Zoology 2015[3]).	2.2.4 Ornithology response to observations document

[2] Birds and Windfarms in Ireland: a review of potential issues and impact assessment: https://tethys.pnnl.gov/sites/default/files/publications/Percival_2003.pdf

[3] Full article: A refinement of the Band spreadsheet for wind turbine collision risk allowing for oblique entry (tandfonline.com)

(FI)	
Impacts on Golden plover (FI)	2.2.4 Ornithology response to observations document
Further concerns relating to importance of wider area for migrating birds, swans, geese, also, woodcock, cuckoo, raven, barn owl, native wildlife, badger, pine martin, otter, brown trout and fish species. (FI)	Not specifically addressed in observations document EIAR Chapter 6
Impacts on other habitats: raised bogs, woodland clearance, and replanting	EIAR Chapter 6
Impacts on Lough Kinale and Derragh Lough NHA	EIAR Chapter 6
No information on restoration of bogs or future habitats at the site	As for Tables 1 and 2 above
Evaluation The applicant has addressed most issues raised as part of the Further Information submitted and Response to Observations (on FI). Uncertainty remains regarding the future land use and rehabilitation of the exploited peatland site at the windfarm. See section 6 of this report.	

4.0 Approach, survey, competence and best practice

4.1. I am satisfied that the biodiversity and ornithology chapters of the EIAR and the Natura Impact Statement (including AA Screening Report and all relevant appendices) were prepared by suitably qualified and experienced Ecologists from MKO and other Environmental consultants. The scope structure and content of the biodiversity and ornithology EIAR chapters and the NIS is in accordance with good practice guidance, including industry specific guidance. Scientific information on surveys, sites, species, and habitats is adequate and included desk study, habitat

survey and detailed surveys for invasive species, breeding birds, wintering birds, mammals and bats. In general, I am satisfied that following the submission of additional information, the ecological surveys were undertaken in line with published good practice methods and at the optimum seasonal periods providing a robust baseline for the impact appraisal as part of the EIAR and the revised NIS. As part of the further information submitted, an additional 13 months of bird survey data was submitted which has been incorporated in revised collision risk modelling. An updated Aquatic survey has also been submitted which addresses concerns regarding age of data in this particular instance and provides up to date water quality data and ecological data to inform the current environmental baseline.

4.2. The Board requested further information on the coverage of the site for bird surveys and DHLGH queried the viewshed utilised in the vantage point (VP) bird survey methodology. A gap in the viewshed was acknowledged by the applicant but considered not significant for the analysis undertaken. The response to further information details the justification of the approach and model used. An additional VP (VP 6) was added to the suite of VPs used by the ecologists in the 2020-2022 surveys. The additional VP did not alter the findings of the previous bird surveys or collision risk modelling presented in the EIAR.

4.3. The lack of nocturnal bird surveys was identified by DHLGH/ NPWS as a concern regarding assessment of movements of species between SPA sites and on migratory routes. The applicant points out that the survey approach is in line with current best practice and follows the recommendation of Scottish Natural Heritage (SNH) *Recommended bird survey methods to inform impact assessment of onshore wind farms* (2017). The recommended methods for Geese and other waterfowl state that vantage point surveys targeting swans and geese should be undertaken "between and including dawn and dusk." This includes the hour before sunrise, the diurnal daylight hours and the dusk period. In practise, this is achieved by the applicant, as is noted in Appendix 7-2 of the EIAR, by starting/finishing a six-hour winter vantage point survey the hour before/after sunrise/sunset.

4.4. The SNH recommended bird survey methods include that "for species which are active at dawn and dusk or at night, other methods of recording or assessing activity need to be employed". Methods such as night vision/infra-red equipment and survey on moonlit nights can establish presence of nocturnal species or presence and direction of feeding/migration movements both by calls and by sight. In terms of the

use of automated sensing techniques, such as radar, SNH recommends that radar is only used to assess sites where there is likely to be high nocturnal activity of important species, especially if an SPA qualifying species is potentially affected. Given the levels of bird activity recorded at the windfarm site and the inclusion of evening surveys over a number of years of survey, I consider that the additional survey effort of conducting specific nocturnal surveys would not be standard.

4.5. The use and reliance on Percival (2003) for assessing the effects of windfarms on birds was queried in a submission. While the publication is 20 years old it does cover the bird species in Ireland that are vulnerable to windfarm development and includes an impact assessment approach based on scientific data. Combined with the Mc Guinness et al (2015)[4] publication and Birds of Conservation Concern in Ireland (BOCCI), I am satisfied that the approach follows best practice in impact assessment. I do note that an updated BOCCI has been published, Gilbert G, Stanbury A and Lewis L (2021), "Birds of Conservation Concern in Ireland 2020 – 2026". Irish Birds 9: 523—544[5] but this does not alter the assessment to any significant degree.

4.6. The use of the Band model for estimating bird collisions at windfarms was also queried with reference to an academic paper in the New Zealand Journal of Zoology (2015) which looked at additional variables and adjustments to that covered in the standard model. I note that this paper was a short communication rather than full study. The Scottish Natural Heritage (SNH) Collision Risk Model (CRM) (also known as the Band model (Band et al., 2007; SNH, 2000)) provides the standard method used in the UK and Ireland and is based on vantage point data to estimate the number of birds likely to collide with turbines at a proposed wind farm. This allows pre-construction assessment of collision impacts on local and national bird populations. Changes in estimates of avoidance rates are routinely published by SNH/ NatureScot and as no changes have been implemented on the overall CRM model and that it remains the industry standard, I am satisfied that it conforms with current best practices in this aspect of analysis.

[4] Mc Guinness, S., Muldoon, C., Tierney, N., Cummins, S., Murray, A., Egan, S. & Crowe, O. (2015). Bird Sensitivity Mapping for Wind Energy Developments and Associated Infrastructure in the Republic of Ireland. BirdWatch Ireland, Kilcoole, Wicklow

[5] BOCCI4-leaflet-2-1.pdf (birdwatchireland.ie)

4.7. In conclusion, I consider that the applicant has addressed the requests posed by the Board and responded to the issues raised by the DHLGH and observers in relation to ecological survey methodologies and age of data. I consider that the applicant has provided sufficient scientific rationale for the level of survey effort, including evening/dusk survey.

5.0 Consideration of the Likely Significant Effects on European Sites

Screening for Appropriate Assessment

5.1. The first test of Article 6(3) is to establish if the proposed development could result in likely significant effects to a European site. The applicant submitted a revised AA Screening Report as part of further information.

5.2. No element of the proposed development is located within or immediately adjacent to a European site and therefore direct impacts can be excluded. Potential indirect impacts could arise and give rise to likely significant effects where 'source' impacts have a pathway to a European site or could affect mobile species associated with SAC or SPA sites i.e. the source pathway receptor model of impact predication. The Applicant used this model and standard bird publications to determine European sites within a likely zone of impact of the proposed development.

5.3. I am satisfied that the applicant has addressed the observations and recommendations raised by observers including the Department and The Boards FI request regarding the screening test (see Table 1 above). On recommendation from DHLGH and taking a stated precautionary approach, an additional SPA site (Garriskil Bog SPA) was *screened in* to be considered in more detail in the NIS and AA. All QI /SPI features from SAC and SPA sites brought forward where the possibility of significant effects could not be ruled out for a European Site.

5.4. European Sites that the applicant determined within a likely zone of impact were screened in for further assessment in the NIS. The proposed development could generate the following impacts that may be significant in relation to the conservation objectives of a number of European sites within a zone of influence of the development (Table 3.1 revised AA Screening Report):

- potential disturbance risks to bird Species of Conservation Interest (SCI) at SPA sites located near development works during the construction phase.

- Ex-situ effects: potential collision risk with turbines and resultant mortality for SCI species within foraging range, migration routes, moving between sites (not explicitly stated in screening but detailed in NIS)
- potential for deterioration of water quality resulting from pollution generated during construction activities where there is hydrological connectivity with SAC/SPA sites
- further identification of impacts and cumulative effects are examined in the NIS including- potential spread of invasive species associated with ground disturbance activities during the construction phase, water quality management during operational phase.

Screening Determination (recommended)

5.5. Having regard to the information presented in the AA Screening Report (updated 2022), observations from the DHLGH/NPWS, the nature, size, scale and location of the various aspect of the proposed development and its likely direct, indirect and cumulative effects, the source pathway receptor principle and sensitivities of the ecological receptors, I consider that the applicant has identified all European sites that could be significantly impacted. I consider that the gaps in the screening report have been sufficiently addressed by the applicant to inform the NIS and the AA to be carried out by the Board.

5.6. The likelihood of significant effects could not be excluded for 7 European sites and therefore appropriate assessment is required to determine if adverse effects on site integrity can be excluded in view of conservation objectives of the following:

- Lough Owel SAC (000688)
- Lough Ennell SAC (000685)
- Lough Owel SPA (004047)
- Lough Ennell SPA (004044)
- Lough Derravarragh SPA (004043)
- Lough Iron SPA (004046)
- Garriskil Bog SPA (004102)

Likely significant effects on other European Sites within a wider area (within 15kms) has been excluded. I am satisfied that this conclusion is based on objective information, the source pathway receptor model and hydrological and hydrogeological data.

Table 4: summary table of European Sites that require AA following screening test for likely significant effects		
European Site	**Qualifying Interest/special conservation interests**	**Potential impacts- could result in likely significant effects.** **(indirect)**
Lough Owel SAC (000688)	White clawed crayfish Hard oligo-mesotrophic waters with benthic vegetation of Chara spp Transition mires and quaking bogs Alkaline Fens	Deterioration of water quality (grid connection along boundary of site along N4)
Lough Ennell SAC (000685)	Alkaline Fen	Deterioration of water quality- hydrological connection (grid connection)
Lough Owel SPA (004047)	Shoveler, Coot Wetland and waterbirds	Disturbance of SCI during construction (grid connection) Deterioration of water quality (as above for SAC)
Lough Ennell SPA (004044)	Pochard, Tufted duck, Coot Wetland and waterbirds	Deterioration of water quality (grid connection)
Lough Derravaragh SPA (004043)	Whooper Swan, Pochard, Tufted duck, Coot Wetland and waterbirds	Windfarm site within potential core foraging range of whooper Swan (collision risk)

		Disturbance to waterbirds during construction (Grid connection) Deterioration of water quality (all operations)
Lough Iron SPA (004046)	Whooper Swan, Wigeon, Teal, shoveler, Coot, Golden Plover, Greenland white-fronted Goose Wetland and waterbirds	Potential pathway for effects (windfarm site) Deterioration of water quality (construction phase including junction works)
Garriskil Bog SPA (004102)	Greenland white-fronted Goose	Windfarm site within core feeding range of the species (collision risk) Precautionary inclusion for operational phase

Natura Impact Statement (overview)

5.7. A revised NIS was submitted by the applicant addressing issues raised as part of the request for further information as summarised in Table 1. The NIS was prepared by Ecologists from MKO with demonstrated experience and competence. The report scope and structure follow best practice and any survey limitations acknowledged.

5.8. The proposed development is described and mitigation measures and best practice measures that have integrated into the design and Construction and Environmental Management Plan (CEMP) are described with the key focus on water quality and management of potentially polluting substances including hydrocarbons and cement-based products.

5.9. Scientific information was collated from desk study, field survey and information from the National Parks and Wildlife Service resources (www.npws.ie). A full description of all ecological surveys including bird surveys and updated survey data from 2021-2022 has been incorporated into the revised NIS (Appendix 4) clarifying and addressing issues raised in the request for further information.

5.10. A desk study on each European Site (Section 4.3 Revised NIS) details information on the qualifying interest features of each site, conservation objectives and site-specific conservation measures (where they exist) and site-specific pressures and threats.

5.11. The assessment of potential effects and associated mitigation is considered in Section 5 of the revised NIS. The potential for ex-situ habitat loss at the proposed windfarm site, disturbance and collision of SCI species associated with SPA sites is considered for key ornithological features that include Whooper Swan, Greenland White-fronted Goose, Golden Plover, Wigeon and Teal. The risk of collision with wind turbines is calculated using the Band method (random) and incorporates current avoidance rates (SNH 2018[6]). (See note in EIAR section 6 below on Golden Plover). The potential for such effects on other SCI bird species including Shoveler, Pochard Tufted Duck and Coot has been excluded by the applicant due to very low- no recordings on the wind farm site during the survey period.

5.12. The potential for bird disturbance within SPA sites that could result from construction related activities and grid connection works is confined to Lough Owel SPA and Lough Derravarragh SPA.

5.13. Of particular significance is the potential for adverse effects on aquatic habitats that would be related to any deterioration of water quality that could occur via hydrological connectivity between the proposed development and European sites due to the release of pollutants and sediments including peat during the construction phase and during the operational and any decommissioning phase. Mitigation measures have been integrated into the design of the proposed development to avoid and reduce any such effects and integrated into the detailed CEMP. Monitoring the operation of mitigation measures is proposed and incorporates field monitoring including daily visual inspections and water testing at various intervals.

5.14. Section 6 of the revised NIS examines the potential for any residual effects on a site-by-site basis examining each SCI in terms of conservation objectives, attributes, and targets and in- combination effects are examined for other projects and plans.

5.15. The NIS concludes that the proposed development will not result in adverse impacts on site integrity of any European Site either alone or in combination with other plans and projects.

[6] Scottish Natural Heritage (2018) Avoidance Rates for the onshore SNH Wind Farm Collision Risk Model V2

Assessment/ examination

5.16. From examination of the further information submitted, I consider that the Inspector and the Board can have confidence in the data collected from ongoing/ additional surveys undertaken and that the ecologists and environmental consultants have addressed observations made in this regard. However, there remains uncertainty regarding the management of the exploited peatlands surrounding the proposed windfarm.

5.17. The current application is stated to consider a *worst-case* scenario based on continued peat harvesting. However, no peat harvesting has taken place at the site for some time and the likelihood of recommencement is uncertain. The current ecological baseline is reflective of a highly managed and damaged peatland habitat. With intervention through active management or if left to regenerate naturally, the site will shift towards a more ecologically diverse situation. This has not been addressed in the EIAR for biodiversity or ornithology or in the NIS.

5.18. EIAR Chapter 3 Assessment of alternatives states the following:

> Should peat extraction cease, a site rehabilitation plan will be required which would be likely to encourage revegetation of bare peat areas, with targeted active management being used to enhance re-vegetation and the creation of small wetland areas. Due to the small footprint of the Proposed Development in the context of the entirety of the commercial peat extraction area, a rehabilitation plan where required would take account of the wind farm infrastructure.

5.19. The DHLGH recommends that the rehabilitation plan should be assessed in conjunction with the EIAR and NIS for the proposed development and that peat harvesting has not been sufficiently addressed in the NIS or in the EIAR in the context of interactions with the proposed development.

5.20. In terms of undertaking the AA, the Inspector and the Board need to ensure that there are no gaps or lacunae in the assessment.

I consider that two issues require consideration:

- Effectiveness of the current drainage and attenuation system at the peatland site (proposed mitigation measures and operation of the windfarm site will integrate with this system)
- Future management of the peatland site and implications for biodiversity

Effectiveness of the current drainage and attenuation system at the peatland site and implications for European Sites

5.21. The applicant states that the assessment in both the NIS and EIAR is made in the context of a worst-case scenario of continuing peat extraction however, the interactions between the land uses is not clear as observed by DHLGH. There is a stated reliance on, and use of the existing drainage within the cutover peatland areas. One of the questions posed by DHLGH is related to the effectiveness of the existing system at preventing peat and sediment ingress into the local watercourses. This has not been fully answered by the applicant and there is currently no peat extraction taking place. In order to come to clear precise and definitive conclusions in relation to the tests for AA, the Board must be satisfied that the mitigation measures proposed will be effective in coping with the combined effects of peat extraction and construction and operation of the turbines at the peatland sites and that measures can be implemented effectively.

5.22. As stated in the EIAR Chapter 9, the River Inny (upper 050) has a WFD status of 3-4 indicating moderate quality, slightly polluted, unsatisfactory condition (latest EPA water quality results for closest test location at Camagh Bridge 2020). As part of my review, I consulted the WFD sub catchment assessment (cycle 2) for the River Inny which states that this status is due to hydromorphological issues caused by commercial peat harvesting and the main risk to the river in not achieving WFD targets is peat (catchments.ie). The WFD assessment goes on to state that as peat is settling out in this section of the River Inny, it has resulted in an improvement in ecological status in lower reaches of the River Inny (below Camagh bridge), the river has remained at Good status for two cycles and is therefore deemed to be Not At Risk in the lower reaches.

5.23. Water quality parameters presented in Chapter 9 show the influence of degrading peat in the river system with elevated Ammonia levels in a number of samples. There

were numerous peat harvesting sites operation in this area until relatively recently and therefore it's not possible to attribute water quality issues to any one particular site.

5.24. The applicant has submitted baseline water quality information on the watercourses that are downstream of the site. These assessments provide an assessment of the baseline water quality against which, any changes that may occur can be measured.

5.25. Hydro Environmental Services (HES) prepared a response on behalf of the applicant to the request for FI with respect to hydrological and hydrogeological matters raised. I note that Consultants from HES prepared the relevant sections of the EIAR. HES provide a statement of experience which demonstrates experience and expertise in windfarm development and wetland and peatland eco-hydrology. The rationale for excluding significant effects on Lough Derravarragh as provided in the EIAR is reiterated and mitigation measures reproduced. The potential for the release of suspended solids to watercourse receptors is considered a key risk to water quality and the aquatic quality of the receiving watercourses and Lough Derravarragh. HES state that proven and effective measures to mitigate the risk of releases of sediment have been proposed and will break the pathway between the potential sources and the receptor. The residual effect is considered to be - Negative, indirect, imperceptible, temporary, low probability impact on the water environment within the Wind Farm Site, along the Grid Connection Route and near other ancillary works (River Inny, Glore River, River Deel, Monkstown stream, Lough Derravarragh).

5.26. In addition, potential effects on Gariskil Bog SAC and Scragh Bog SAC are considered and scientific rationale presented on the limited potential for hydrological impacts on theses sites.

5.27. In response to the request for further information, the applicant has submitted an updated aquatic survey by Aquatic consultants Triturus. The surveys provide up to date data on the aquatic ecology of watercourses within a zone of influence of the windfarm site, the proposed underground cable and access road. Macroinvertebrate surveys of water quality were in line with chemical results and showed decreased water quality in lower reaches of River Inny (Q3).

5.28. A comprehensive suite of mitigation measures have been proposed. The locations of proposed mitigation measures are shown on drawings D101 to D107 and further suite of water quality parameters are presented as part of the water quality monitoring proposals at location along the Glore and Inny Rivers. The extensive network of peat

management and forestry drains on the site will be integrated and enhanced as required and used within the Wind Farm Site drainage system. The integration of the existing drainage network and the Wind Farm Site network is considered relatively simple by the applicant. The key elements being the upgrading and improvements to water treatment elements, such as in line controls and treatment systems, including silt traps, settlement ponds and buffered outfalls.

5.29. The consideration of the construction and operational management on the hydrological environment with peat harvesting is not explicit despite a stated assessment of worst-case scenario with this activity. The existing drainage and settlement system and proposed measures should demonstrate that they can cope with the management of peat fines in the event of peat harvesting and construction occurring at the same time. If peat harvesting is taking place, who has responsibility for management and maintenance of settlement ponds, outfalls and cross drains?

5.30. In terms of the existing drainage system the applicant states that maintenance and management will be included in the overall maintenance regime of the windfarm- with inspections of swales and settlement ponds, cross drains, outfalls and the progress of revegetation. Measures include inspection and regular clearing of drainage channels and settlement ponds in line with the CIRIA C697 SuDS manual.

5.31. Lough Derravarragh SPA is the only European site with direct hydrological links to the windfarm site via the River Inny and its tributaries. The conservation objective of relevance is *to maintain or restore the favourable conservation condition of the wetland habitat at Lough Derravarragh SPA as a resource for the regularly-occurring migratory waterbirds that utilise it*. As detailed in the NIS (Table 6-10) deterioration of water quality could potentially lead to adverse impacts on food availability and nesting/foraging habitat.

5.32. Lough Derravarragh is classified as being of Good ecological status in the WFD 2016-2021 assessment and not at risk. There are no site-specific conservation objectives for the SPA (at time of examination). Looking to other SPA sites, the conservation attributes and targets commonly associated with the SCI of wetland habitat are:

- Wetland habitat area: no significant loss wetland habitat within the SPA, other than that occurring from natural patterns of variation

- Wetland habitat quality and functioning: no significant impact on the quality or functioning of the wetland habitat within the SPA, other than that occurring from natural patterns of variation

5.33. Any significant impact on the quality, functioning and accessibility of the wetland habitat within the SPA would likely significantly negatively impact the regularly occurring migratory waterbirds that utilise the wetland habitat. Impacts on wetland quality, functioning and accessibility would likely reduce the diversity and abundance of waterbird species that the wetland can support. This, in turn, could negatively impact the Conservation Objectives for waterbird species listed as Special Conservation Interests in the SPA or other regularly occurring migratory waterbird species.

Summary and Conclusions:

5.34. The applicant has not provided evidence of the effectiveness or otherwise of the current drainage and sediment management system at the peatland sites within the (lands optioned) windfarm site. Evidence from water quality data shows that degrading peat in the River Inny has had negative impacts however, peat harvesting has decreased in the local area and there are inherent difficulties in isolating the proposed windfarm site from other peatland site in the area. Mitigation measures need to ensure that the situation is not exacerbated, and measures must prevent ingress of peat fines and silt and construction related compounds.

5.35. Based on the detail provided in the NIS, the EIAR and information submitted as part of further information I am satisfied that the mitigation measures proposed are robust and are general best practice for the windfarm site in isolation, however, it is unclear how they would interact with the current exposed peat or how they would be implemented if peat harvesting is taking place as is the stated worst-case scenario. I consider that despite the mitigation and monitoring commitments, an element of uncertainty remains regarding the combined effects of the peatland management and windfarm site works including construction and operation on the hydrological environment in terms of peat ingress in particular and there is evidence that local watercourses have been impacted by peat harvesting.

5.36. In the absence of complete, precise, and definitive information on the functioning of the existing drainage system and responsibly for management of same, I consider that there is reasonable doubt as to the effectiveness of the proposed mitigation measures

in dealing with the combined issues of construction works on exposed peat and the wider exploited peat basins whether peat harvesting is taking place or not. This raises uncertainly as to the effectiveness of the measures designed to prevent impacts on water quality of the River Inny and on the quality and functioning of wetland habitats of Lough Derravarragh SPA downstream.

Future management of the peatland site and implications for birds and biodiversity

5.37. As outlined in the earlier section of project description, an area of uncertainty remains as to the mid to long-term management of the exploited cut over/milled peat area once peat harvesting ceases permanently. While excluded from the boundary of the proposed windfarm site, the management of the cutover bog is an integral element of the windfarm site and of relevance to the overall operational effects of the proposed windfarm. The long-term management of the exploited peatland over the lifetime of the proposed windfarm is to be left to the yet to be established Interactions Management Group that will comprise of Coole wind farm Ltd, and all relevant landowners and tenants. It is stated that any future rehabilitation works would be subject to its own assessment and would have to consider the windfarm as part of the cumulative assessment. It is currently unclear under what provisions this would be considered or permitted. There is no clear indication what the focus of future rehabilitation would be, for example, amenity, biodiversity or forestry. The EIAR states that a rehabilitation plan would be 'likely to encourage revegetation of bare peat areas, with targeted active management being used to enhance re-vegetation and the creation of small wetland areas'.

5.38. For the benefit of the Board, I include a definition of peatland rehabilitation. This comes from the Bord na Mona Biodiversity Action Plan[7] :

REHABILITATION: refers to the primary objective of environmental stabilisation of the former peat production areas or cutaway bogs. This usually involves some form of management to ensure the revegetation of former peat production fields and/or habitat creation/enhancement (as outlined in Bord na Móna Biodiversity Action Plan 2010-

[7] https://www.bordnamona.ie/wp-content/uploads/2021/04/Biodiversity-Action-Plan-2016-2021.pdf

2015). It may also include reclamation for agriculture and/or forestry, and/or amenity use.

5.39. In terms of any future peatland restoration and rehabilitation, work done by Bord Na Mona is showing that rehabilitation of peatlands following the cessation of peat production has a positive effect on biodiversity in general with some areas becoming habitat and species hotspots according to local characteristics.

Impacts on SCI birds

5.40. I am satisfied that the applicant has addressed and bolstered the assessment of possible adverse effects on SCI bird species through the clarifications on survey coverage at the windfarm site, submission of additional bird survey data and assessments of various turbine design parameters. The assessment is based on the best available data for the current situation. Cut over peat is not a habitat that offers high habitat value for most bird species. However, where peatlands have been rehabilitated, the blocking of drains, the revegetation of exposed peatlands and in particular the creation of wetland habitats increases the biodiversity value of the site and can result in habitats that are of value to wintering waterbirds.

5.41. A stated assumption in-built in the collision risk model used by the applicant (Band model) is that the habitat and bird activity will remain the same over time during the operational stage of the windfarm. However, this is unlikely to be case at the proposed windfarm site if peat harvesting does not recommence and/or a habitat rehabilitation plan is developed and thus undermines an inbuilt assumption of the collision risk model.

5.42. Management of the windfarm site and exploited peatland should take these variables into account and ensure that any rehabilitation measures do not create an ecological trap that could increase collision risks for birds drawn into any wetland sites for example. This has not been considered in any detail by the applicant in either the NIS or EIAR, rather it is stated that a rehabilitation plan would have to take the windfarm into account in any biodiversity or AA.

5.43. Survey and analysis undertaken by the applicant at the windfarm site and of wetland sites in the wider area shows that the windfarm site is located within foraging ranges for a number of SCI species (based on SNH guidance). These include:

- Whooper swan associated with Lough Derravarragh SPA (4.8km). The Applicant did not record any regular commuting/ migratory flights that would constitute evidence of connectivity between the SPA and proposed development area. Observations of flocks were no greater than of county importance were recorded near the windfarm site.
- Greenland white fronted Goose associated with Garriskil Bog SPA (7.2km)- however geese have not been present at this SPA in recent years. Low numbers of birds were recorded in the vicinity of the windfarm site and taking a precautionary approach, given a valuation of county importance.
- Greenland white fronted Goose, Whooper Swan, Golden Plover, Teal and Wigeon associated with Lough Iron SPA. At 11.4kms distance, the windfarm site is located outside of estimated potential foraging ranges, however the applicant includes this site on a precautionary basis.

5.44. Analysis of the data showed that no significant displacement or barrier effects are predicted, and collision risk is very low for all species with the exception of Golden Plover with high numbers regularly recorded within and in the vicinity of the windfarm site. However, the data points to the fact that Golden Plover recorded at and in the vicinity of the windfarm site is a largely resident population during the winter months on local areas of cut over bog and not a population associated with Lough Iron SPA (See biodiversity assessment).

5.45. The applicant excludes adverse effects on SPA populations and therefore maintains no adverse effects on site integrity of SPA sites within a possible zone of influence of the windfarm site (and also the grid connection and all aspects of the proposed development).

5.46. Future land use changes are difficult to predict, however it is likely that some degree of habitat improvement will occur within the lifetime of the operation windfarm and particularly if a rehabilitation plan is implemented. This undermines the assumptions of the bird collision risk model in terms of habitats remaining constant and similar levels of birds at the site.

5.47. In terms of SCI species associated with SPA populations, I consider that whooper swan would be the SCI species most likely to be influenced by any land use and habitat changes based on their ecology, survey records of birds flying/commuting across the area and records in the vicinity of the site. The development is located

within the potential core foraging range of Whooper Swan, an SCI species of Lough Derravarragh SPA (4.8km south) and Lough Iron SPA is located outside of stated foraging range (>11km). Adverse effects on the SPA populations are discounted by the applicant due to the unsuitability of the cutover bog habitat as an ex-situ habitat and a lack of any apparent migration or regular commuting routes. However, other former peatland sites in the midlands have developed habitats that attract wintering waterbirds including whooper swan.

5.48. I note from Section 7.8.2.1 of the EIAR that whooper swans in flight were rarely recorded over the windfarm site during VP surveys in the period 2015-2020 with four flights (1-7 birds) recorded in 2015-2017 and five flights (1-14 birds) in the survey period of 2018-2022. However, all flights were within or partially within (500m) the potential Collison zone of the turbines. Winter transect surveys which were focused on habitat use, showed the area of the proposed windfarm site not to be favoured by the species with just one record of a flock of whooper swan on the site (January 2017). Surveys undertaken in March 2022 showed an increased number of observations (25) of whooper swan in flight (flocks of 2-16 birds) on six separate dates over the months October, January and February, illustrating the variability in movements of birds. The applicant states that the majority of these flights were associated with the Inny River corridor along the western margin of the site however, there are flights recorded across the windfarm site, within the potential collision areas of turbines (Map ref: WS01- WS016 in Appendix 5 of the RFI Response) .

5.49. An updated collision risk for Whooper swan (based on155m rotor diameter) has been calculated at a ratio of 0.79 collisions per year based most recent data and on the current situation (cut over bog) which is not considered significant at the population level (County: 982 birds)). I calculate this to be 1 bird every 1.2 years and an overall 0.4% increase in county level mortality rates (taking background mortality at 20% as used in EIAR[8]). I note that the Bird survey report March 2021- March 2022 updates the county Westmeath population of whooper swan to 982 based on the 2020 International Swan Census, up from a figure of 389 in the EIAR (Swan census 2015). While the updated bird survey report March 2021-2022 states that these estimates are not significantly different from that presented in the EIAR, I note that a ratio of 0.14 collisions per year (1 bird every 7 years) with an increase to background mortality of

[8] 20% of 982=196.4

0.18% was predicted based on data employed- see EIAR 7.8.2.1. As these calculated increases to background mortality levels are below 1%, no significant effects at the County population level are predicted.

5.50. My concern is that these figures may underestimate collision risk as they are based on assumptions of no changes in habitat and bird use in future. For example, by my calculations, an increase of collision risk from 0.79 to 1.97 per year at the proposed Coole windfarm would result in a 1% increase in overall mortality levels[9] to Whooper Swan that could be significant at the County level (based on an updated County Westmeath population of 982 individuals). I also note that significance levels calculated is based on the County level population. The estimated collision risk ratio of 0.79 whooper swans/ year would translate as a significant effect on the Lough Derravarragh SPA population and could undermine the conservation objectives of the SPA for this species if the birds were associated with that SPA (regionally important population with baseline of 102 individuals, collision risk of 0.79 birds/year would translate to a 3% increase in background mortality).

Summary and Conclusion:

5.51. Based on the evidence provided, I consider Whooper Swan would be the SCI species most likely to be influenced by any land use and habitat changes due to the location of the windfarm site within the core foraging range of population associated with Lough Derravarragh SPA ,the location of the windfarm site between other SPA sites/ wetland sites where Whooper Swan was recorded and records of flight activity (low) over and within the general area of the windfarm. The development of areas of wetland habitat may increase the attractiveness of the site for these wetland birds for feeding or roosting, thereby increasing risk of collisions. The collision risk model assumes that habitat and bird use at the site remain the same over the lifecycle of the windfarm, however this is unlikely to be the case as a rehabilitation plan will improve the biodiversity value of the cutover peatland areas and may attract wintering waterbirds and whooper swan in the longer term, thereby undermining the conclusions of the model.

[9] 1.97 ÷ (196.4+198.37) x100 = 1%

Likely effects on the Environment: Biodiversity and ornithology

5.52. EIAR Chapters 6 Biodiversity and 7 Ornithology describe and evaluate the habitats, their representative flora and fauna and addresses the potential impacts of the development on the ecology of the site and the surrounding area. The biodiversity and ornithology assessments consider ecological impacts outside of the strict requirements of the Appropriate Assessment which only considers impacts that could affect qualifying interests/ Special conservation interests of European Sites (SACs and SPAs).

5.53. The Applicant has addressed biodiversity and ornithology submissions as part of the information submitted as further information and observations received on further information as detailed in Tables 2 and 3 of this report. I note that Figure 6-7 submitted as part of FI details mammal surveys and habitats of significance, and I am satisfied that the requirements of regulation 51 of EC Regulations 2011 are addressed in relation to otter and badger. I am also satisfied that the applicant has demonstrated that no significant effects are likely for other mammal species, including bats, based on assessment of impact and application of mitigation measures.

5.54. I am satisfied that the applicant has attempted to address the most significant issues raised by DHLGH and most of the public submissions on biodiversity. However, the uncertainty regarding the short term and enduring management of the peatland site also applies to the biodiversity and ornithology assessments detailed in the EIAR and further information. The is a likelihood of a shifting baseline in terms of ecology and biodiversity value of the site and the future use and management of the wider peatland site cannot reasonably be excluded from the overall windfarm development. Peatland rehabilitation projects elsewhere have shown that biodiversity improves. Engagement with this process as part of the windfarm development could demonstrate real biodiversity net gain at the site over the lifetime of the project and take account of the habitat change in bird collision risk models.

5.55. As discussed in the previous section, habitats may develop that draws wintering waterbirds to the site in greater numbers than is currently the case. This may undermine the current assumptions in collision risk modelling and residual effects for key ornithological receptors. The DHLGH expressed concern regarding impacts on bird species, in particular breeding birds including buzzard, lapwing, peregrine and wintering golden plover.

5.56. Both the DHLGH and public observations raise concerns regarding the potential impacts on golden plover as the EIAR findings showed the highest predicted annual mortality of all species recording during surveys at 34 collisions per year. As a species showing declines of >20% in recent years in Ireland, such impacts would be of significant concern.

5.57. As part of the further information submitted the applicant commissioned a study to examine and re-evaluate the avoidance rate for golden plover (Appendix 2 of Bird Survey Report: March 2021-March 2022). The latest version SNH guidance (SNH, 2018) does not include a species-specific avoidance rate for wintering Golden Plover populations and the default 98% avoidance rate was utilised in the collision risk model (CRM). The study used data available from post-construction monitoring in Scotland that indicates that a much higher avoidance rate should be applied to wintering golden plover populations. Based on an analysis of this information which I consider robust, the author recommends that collision risk modelling for wintering golden plover populations use two avoidance rate values: 99.6% and 99.8%. These predicted collisions will be five times, and ten times, respectively, lower than predicted collisions calculated with the default 98% avoidance rate. The author acknowledges the potential issues associated with using data from other studies but considered it an appropriate and up to date estimate of evidence-based avoidance rates. I am satisfied that this re-evaluation is based on robust scientific data, but I point out the Board that this is not an industry standard and not currently included in the standard avoidance rates published by SNH. The updated collision risk for golden plover for a 155m rotor diameter using the 98.6% avoidance factor equates to 10.858 birds/ year or 317 over the lifetime of the windfarm, a significant decrease on what was originally predicted.

Summary and conclusion

5.58. The applicant does not predict any significant impacts on biodiversity following assessment and application of mitigation measures. The issues of future land use at the cut-over peatlands calls into question assumptions on the bird collision risk models. The predicted severity of impacts on Golden plover has been reduced however, it remains the species with highest possible mortality from collision risk modelling at the windfarm site. Lack of engagement with any future peatland

rehabilitation plan misses the opportunity to demonstrate meaningful biodiversity net gain at the site over the lifetime of the project and also misses the opportunity to take account of the habitat change in bird collision risk models.

6.0 **Conclusion**

6.1. In order to reach a determination of no adverse effects on the site integrity of European Sites as part of Appropriate Assessment, the Board must be able to come to complete, precise and definitive findings and remove reasonable scientific doubt regarding such effects.

6.2. I consider that uncertainty remains regarding the short term and enduring management of the peatland site which cannot reasonably be separated from the proposed windfarm either during construction or operation.

6.3. If peat harvesting is to continue at the site, the mitigation measures proposed to prevent degradation of water quality in local rivers and Lough Derravarragh SPA downstream must be robust enough to cope with the combined effects of the windfarm operations and peat harvesting and be capable of being implemented effectively. In the absence of complete, precise, and definitive information on the functioning of the existing drainage system and responsibly for management of same, I consider that there is reasonable doubt as to the effectiveness of the proposed mitigation measures in dealing with the combined issues of construction works on exposed peat and the wider exploited peat basins whether peat harvesting is taking place or not. This raises uncertainly as to the effectiveness of the measures designed to prevent impacts on water quality of the River Inny and on the quality and functioning wetland habitats of Lough Derravarragh SPA downstream.

6.4. If, on the other hand peat harvesting is to cease permanently, there has been no assessment of the implications of a peatland rehabilitation plan on the local biodiversity as part of the EIA or in the NIS. The Bird collision risk model is based on assumptions that habitat and bird use at the site will remain constant over the lifecycle of the windfarm which is not likely. Therefore, the collision model and assessment may underestimate the risk to SCI birds including Whooper Swan in particular, and pose a risk of undermining the conservation objectives of Lough Derravarragh SPA if

the windfarm area developed into more favourable foraging area, being with the potential foraging range of the species.

6.5. I consider that these uncertainties cast reasonable doubt on the ability of the Board to come a conclusion of no adverse effects on the integrity of Lough Derravarragh SPA. The appropriate assessment should contain complete, precise, and definitive findings and conclusions capable of removing all reasonable scientific doubt as to the effects of the proposed windfarm development in combination with the existing and future management of the peatland site on the site concerned. Where this cannot be achieved, the Board is precluded from granting planning permission.

6.6. The uncertainty regarding the short term and enduring management of the peatland site also casts doubt on a number the conclusions set out by the applicant for wider biodiversity and ornithology. By not considering or engaging in future peatland restoration at the windfarm site, collision risk may be underestimated for a number of bird species including wintering birds and raptors, and opportunities for engaging in meaningful biodiversity net gain have been missed.

Signed 

Date: 14th July 2023

Dr Maeve Flynn
BSc. PhD, MCIEEM

Inspectorate Ecologist
An Bord Pleanála

Checklist for Biodiversity/Ecological Impact Assessment (EcIA)

Based on CIEEM (2019) *EcIA Checklist*[10] and amended to Irish context.

A suggested tool for use when examining and evaluating a Biodiversity Chapter in an EIAR as part of EIA, or a Biodiversity/ Ecology section in an Environmental /Planning Report

Biodiversity and Ecological impact Assessment Criteria		Yes No n/a	Paragraph reference number (s)
Pre-app/scope	1. Where pre-application advice has been received from a statutory body (e.g. DAU /NPWS, IFI), and/or relevant NGO it has been fully accounted for in the EcIA.		
	2. The scope, structure and content of the EcIA is in accordance with published good practice[i], [ii] , [iii] and/or industry specific guidance[iv]		
Surveys, Sites, Species and Habitats	3. Adequate and up-to-date[v] : a. Desk study has been undertaken b. habitat survey has been undertaken[vi] c. more detailed ecology surveys have been undertaken (where necessary e.g. habitat specific and/or species specific)		
	4. All statutory and non-statutory sites likely to be significantly affected are clearly and correctly identified (e.g. SAC, SPA, NHA, pNHA, National parks, Nature reserves, local biodiversity areas).		
	5. All protected species[vii] likely to be significantly affected are clearly and correctly identified, and adequate surveys have been undertaken to inform the baseline.		

[10] https://cieem.net/resource/ecological-impact-assessment-ecia-checklist/

	6. Any invasive non-native plant species present are clearly and correctly identified.		
	7. Where separate detailed surveys are required, these have been undertaken in full and results submitted with the application (or lack of such surveys is justified).		
Impacts and Effects	8. The assessment is based on clearly defined development proposals along with relevant drawings/plans **Or** 9. The residual ecological effects are not significant at any geographical scale irrespective of the detailed development proposals, and the assessment is based on a worst-case-scenario.		
	10. The report describes and assesses all likely significant ecological effects (including cumulative effects) clearly stating the geographical scale of significance (where relevant); Cross reference with AA Screening Report/ NIS (as relevant).		
Mitigation, Compensation and Enhancement	11. The mitigation hierarchy has been clearly followed: e.g. Avoidance, minimization, mitigation by remedy, compensation.		
	12. The report: a. Clearly identifies the proposed mitigation and any compensation measures and explains how these will adequately address all likely significant adverse effects. b. Includes, where necessary, proposals for post-construction monitoring.		

	c. Recommends how proposed measures may be secured through planning conditions/obligations and/ or any necessary licenses.		
	13. A summary table of proposed mitigation and compensation measures has been provided.		
	14. The need for any mitigation/derogation licenses required in relation to protected species is clearly identified; any approved derogations licenses are included with the application.		
Competence/ Good Practice	15. Any limitations of the ecological work have been correctly identified and the implications explained.		
	16. All relevant key timing issues (e.g., site vegetation clearance or roof removal) that may constrain or adversely affect the proposed timing of development have been identified.		
	17. All ecological work and surveys accord with published good practice methods and guidelines. **OR** 18. Any deviation from such guidelines is made clear and fully justified, and the implications for subsequent conclusions and recommendations made explicit in the report.		
	19. All ecologists and surveyors have the necessary (demonstrated) competencies to carry out the work undertaken and/or hold appropriate species licenses (where relevant)		

Conclusions	20. The report clearly identifies where the proposed development complies with relevant legislation and policy, highlighting any possible non-compliance issues, and highlighting circumstances where a conclusion cannot be drawn as it requires an assessment of non-ecological issues (such as socioeconomic ones)		
	21. The report provides a clear summary of losses (and any gains) for biodiversity		
	22. Justifiable conclusions based on sound professional judgement have been drawn as to the significance of effects on any designated site, protected or priority habitat/species or other ecological feature, and a justified scale of significance has been stated.		

References and links cited in the report

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[iii] CIEEM (2018) Guidelines for Ecological Impact Assessment: https://cieem.net/resource/guidelines-for-ecological-impact-assessment-ecia/

[iv] *For Example*: TII Guidelines for Assessment of Ecological Impacts of National Roads Schemes (2008), https://www.tii.ie/technical-services/environment/planning/Guidelines-for-Assessment-of-Ecological-Impacts-of-National-Road-Schemes.pdf and other TII documents: https://www.tii.ie/technical-services/environment/planning/

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[v] CIEEM (2019) Advice note on the Lifespan of Ecological Reports and Surveys: https://cieem.net/resource/advice-note-on-the-lifespan-of-ecological-reports-and-surveys/

[vi] The Heritage Council, A Guide to Habitats in Ireland, (Fossitt, 2000): https://www.npws.ie/sites/default/files/publications/pdf/A%20Guide%20to%20Habitats%20in%20Ireland%20-%20Fossitt.pdf

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https://www.heritagecouncil.ie/content/files/best_practice_guidance_habitat_survey_mapping_onscreen_version_2011_8mb.pdf

[vii] Checklist of protected and threatened species in Ireland (2019). Wildlife Manuals, No. 116. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, https://www.npws.ie/sites/default/files/publications/pdf/IWM%20116%20Checklists%20Protected%20and%20Threatened%20Species%202019.pdf

Also: IWM 116 Checklists Protected and Threatened Species Version 3.1 1 February 2023.xlsx