An Bord Pleanála

Inspector's Report ABP 306706-20

Development:	Ten-year permission for a windfarm consisting of 21 no. wind turbines and all associated development.
Location:	Derrinlough and other townlands. Co Offaly.
Planning Authority:	Offaly Co. Council.
Applicant:	Bord Na Mona Powergen Ltd.
Type of Application:	Strategic Infrastructure (Section 37E).
Prescribed Bodies:	Inland Fisheries Ireland. Transport Infrastructure Ireland. Irish Water. Irish Aviation Authority. Department of Culture Heritage & the Gaeltacht. Geological Survey Ireland. Environmental Protection Agency

Observer(s):	17 submissions (listed overleaf)
Date of Site Inspection:	May 11th & 15th, 2020.
Inspector	Breda Gannon.

List of Observers

1. Margaret Madden
2. Noel Devery
3. Frank Clarke
4. Mark Devery
5. Barbara & John Feeney
6. Damien Mc Donagh
7. John Devery
8. Agnes Doolan
9. Teresa Ryan-Feehan
10. Paul Kilmartin
11. Patrick Declan Troy
12. John Dooley
13. Patrick Horan & Others
14. Edward John Bulfin
15. Gerard Mc Evoy
16. Declan Leonard
17. Galetech Energy Services

Contents

1.0 Introduction 5

2.0 Site Location and Description 5

3.0 Proposed Development 6

4.0 Submissions 11

5.0 Planning History 28

6.0 Further Information 31

7.0 Legislative and Policy Context 31

8.0 Planning Assessment 45

8.1 Principal of the Development 45

8.2 Compliance with Wind Energy Strategy 47

8.3 Legal Matters 50

8.4 Impact on Amenities of Property in the Vicinity 50

8.5 Ownership Issues 51

8.6 Other Matters 52

9.0 Environmental Impact Assessment 52

9.1 Statutory Provisions 52

9.2 Compliance with Legislation 53

9.3 Alternatives 55

9.4Likely Significant Effects on the Environment 58

9.5 Population and Human Health 59

9.6 Biodiversity 66

9.7 Ornithology 84

9.8 Land, Soil and Geology 94

9.9 Hydrology and Hydrogeology 102

9.10 Air and Climate 114
9.11 Noise & Vibration 119
9.12 Landscape &Visual Impact 126
9.13 Archaeology, Architecture &Cultural Heritage 143
9.14 Material Assets 148
9.15 Interaction of Effects 160
10.0 Appropriate Assessment 161
11.0 Recommendation 183
12.0 Conditions 189

1.0 Introduction

This is an application made by Bord Na Mona Powergen Ltd for strategic infrastructure under section 37E of the Planning and Development Act, 2000, as amended. The application is made pursuant to formal notice issued by the Board dated 25th November, 2019, where it determined under section 37B(4)(a) of the Planning and Development Act, as amended that the proposed development falls within the scope of paragraphs 37A(2) (a),(b) and (c), requiring that the application be made directly to the Board.

2.0 Site Location and Description

The site is located approximately 2km south of the village of Cloghan and 3.4km east of Banagher in Co. Offaly. It comprises a large area of ground (2,360ha) which is encircled by regional roads to the north (R357), west (R438) and east (R437) and by a series of local roads to the south. The site is a combination of two bogs, Clongawny to the west and Drinagh to the east which are part of the Boora peat production bog group in Co. Offaly. The bogs are intersected by the N62 which runs in a north-south direction. There is access to both bogs off the national secondary road. The N62 connects with the N52 further south at Kennedy's Cross Roads.

The Derrinlough Peat Briquette Factory is located on the eastern side of the N62, between the two bogs. This plant processes the peat from a number of bogs in the midlands into briquettes and consists of the factory and a number of ancillary buildings. Peat production has now ceased on the site. Immediately to the south of the briquette factory, lies Erin Horticulture Ltd, which produces garden compost. A site compound relating to the former peat harvesting works lies close to the main entrance on the western bog site.

The majority of the site comprises drained cutover bog. For the most part the topography is relatively flat with isolated more elevated areas. The bog is generally contained by 1-2m peat mounds/banks and its surface is drained by a network of drains. Both bogs are intersected by Bord na Mona rail lines which serve adjacent bogs and the briquette factory. Drinagh wetlands lie to the east and there is another wetland area to the south east of Clongawny bog bordering the N62. Other land uses

within the site include revegetated peat, commercial forestry, telecommunication (30m mast) and wind measurement (a 100m anemometry mast on Clongawny Bog).

There are a number of electricity lines in the vicinity, including the 110 kV network which includes two lines running to the north of both bogs, one line to the west of Clongawny and one line to the east of Drinagh.

The closest settlements are Cloghan to the north (2km), Fivealley to the south (2.5km) Banagher to the west (3km), Ferbane to the north (6km), Birr to the south-west (7km) and Shannonbridge to the north east (15km). Outside the settlements, the pattern of residential development consists of one-off rural housing scattered along the adjacent road network, predominantly along the R438 to the west, the R 356 to the north and the local road network in the vicinity of the site.

Lough Boora Discovery Park is located c.6km to the east and includes a number of walking, cycling routes. The Offaly Way and the Hymany Way are all located within 10km of the site. The River Shannon is used by recreational craft with marinas etc at Banagher 3km to the east.

The closest European sites include the River Shannon Callows SAC and the Middle Shannon Callows SPA, located 2.5 km to the north-west. In terms of National designated sites, Lough Coura pNHA adjoins the subject site to the south. The Lough Boora pNHA is located c.4km to the east while the Grand Canal pNHA is located c.3km to the north-east.

3.0 **Proposed Development**

A detailed description of the proposed development is provided in the public notices and the EIAR submitted with the application. The proposed development includes the following:

- 21 no. wind turbines with an overall blade tip height of 185m and all associated hard-standing areas.
- 2 no. permanent anemometry masts up to a height of 120m.
- New and upgraded internal access roads, passing bays, amenity pathways, amenity carpark and associated drainage.

- 2 no. permanent underpasses in the townland of Derrinlough, one located beneath the N62 and one beneath an existing Bord Na Mona rail line.
- 1 no. 110 kV electrical substation which will be constructed in the townland of Cortullagh or Grove. The electrical substation will have 2 no. control buildings, associated electrical plant/equipment and a wastewater holding tank.
- 5 no. temporary construction compounds in the townlands of Clongawny More, Derrinlough, Derrinlough/Crancreagh, Drinagh and Curtullagh or Grove.
- All associated underground electrical and communications cabling connecting the turbines to the proposed electrical substation.
- 2 no. temporary security cabins at the main construction site entrances in the townland of Derrinlough.
- All works associated with the connection of the proposed windfarm to the national electricity grid which will be to the existing Dallow/Portlaoise/ Shannonbridge 110 kV line to the north of the site.
- Removal of existing meteorological mast.
- Upgrade of existing access and temporary improvements and modifications to existing public road infrastructure to facilitate delivery of abnormal loads including locations on the N52 and N62; construction access for delivery of construction materials at locations on the N62 and R357; operational access onto the L7009 in the townland of Cortullagh or Grove and amenity access off the R357 and L7005.
- All associated site works and ancillary development including signage.
- A 10-year permission and a 30-year operational life from the date of commissioning of the entire farm.

The proposed permanent footprint of the proposed development measures c 34.2 ha. A detailed description of the proposed development is contained in Chapter 4 of the EIAR. The overall layout of the proposed development is shown on Figure 4.1. The main components of the proposal are described below for the information of the Board.

- The turbines dimensions would be as follows:

- maximum tip height of 185m.
- maximum hub height of 110 from top of foundation.
- maximum rotor diameter of 150.
- rated output of 4.2 MW with a combined output of 88.2 MW for the farm.
- conventional three blade design rotating in the same direction.
- off-white or grey in colour.

The turbines would be arranged in two clusters across the two bog sites. Turbine No's 1-11 would be located on Clongawny Bog to the west of the N62 and turbine No's 12-21 would be located on Drinagh Bog to the east. The turbines would be arranged within the site to maximise energy yield and to ensure turbulence and wake effects do not compromise performance. The exact type and model of turbine would be dictated by a competitive tender process but would not exceed a tip height of 185m above top of foundations.

- The turbines would be secured to a reinforced concrete foundation installed below ground level on a granular sub-base after the excavation of soil and peat. The foundation would be formed on competent strata or using piling methods. Hard-standing areas consisting of levelled and compacted hardcore would be required around each turbine base to facilitate access, turbine assembly and erection (Fig 4.2). The hard-standing areas would be constructed to c.1m above the existing ground level. The first 600mm (approx.) above ground level would comprise construction grade granular fill and the final 600m (approx.) surface layer would comprise final surfacing materials, generally washed gravels. Levelled assembly areas would be located on either side of the hard-standing area for offloading turbine blades, tower sections and hubs from trucks.
- Approximately 29.3 km of access road would be constructed within the site including the upgrade of 450m of existing access road. The roads would be required to connect the turbines and associated infrastructure. A variety of road types would be required depending on existing ground conditions and would include excavated and floating roads over/through peat and the

upgrade of existing excavated/floating roads. Typical cross sections for the road types are shown in Figures 4.4 to 4.7 of the EIAR. The construction techniques proposed to be used across the site are shown in the Peat and Spoil Management Plan (Appendix 4-2).

- The location of the underpasses are shown in Appendix 4.1 of the EIAR. One would be provided underneath the N62 immediately north of Derrinlough Brick Factory and the second will be provided beneath an existing Bord Na Mona rail line to the west. The underpasses would be used for amenity purposes and for wind farm maintenance during the operational phase. The underpasses would be approximately 35m in length, 4.5m wide and 4.5m high and would be take the form of precast concrete box culverts which would be founded on an in-situ concrete slab base and may need to be underpinned by piles. Typical plan view and sections are shown in Figure 4.8.
- The proposed substation compound would be located adjacent to the north-eastern section of the site, off the proposed new road and south of the north eastern site entrance off the R357. It would be constructed to c 50.26m OD. It would have a footprint of c 17,500 m2 and include two control buildings (TSO and IPP control buildings) and the electrical components necessary to export the electricity from the windfarm to the national grid (Fig 4.9). The compound would be surrounded by a c 2.6m high steel palisade fence. The control buildings would include welfare facilities for staff. A groundwater well would be installed as a water supply, with bottled water supplied for drinking if required. Wastewater would be managed by means of a sealed storage tank with all wastewater being tankered off site.
- Each turbine would be connected to the onsite electricity substation via an underground 33 kV electricity cable. Fibre-optic cables would also connect each turbine to the wind farm control building in the onsite substation compound. The electricity and fibre-optic cables would be run in cable ducts approximately 1.3 m below the ground surface, along the sides of, or, underneath the internal roadways. The route of the cable ducts would follow the access track to each turbine location. The indicative position of the cable trench relative to the roadways is shown in section in Figures 4.4 to Figure 4.7 of the EIAR.

- The grid connection would originate at the proposed onsite substation and would be connected to the national grid via either an underground grid connection cable or overhead line which would connect into the existing 110 kV line c 300m north of the substation. The route is indicated in Figure 4.14. Planning permission is being sought for the overhead line and underground cabling options but only one route would be used to connect the proposed development to the national grid. The overhead option would require 530m of new 110 kV transmission line and the installation of 6 no. new lattice towers (up to 20m in height) within the site. Should the connection be via underground cable, c 700m of transmission cable would be required. The final grid connection method and route would ultimately be decided by ESB/ EirGrid.
- Two anemometry masts would be required as part of the development, one in each bog. The masts would be equipped with wind monitoring equipment at various heights. The masts would be free-standing structures and constructed on a hard-standing area. The location of the masts is shown on Figure 4.1 and a typical design is shown in Fig 4.16.
- Five temporary construction compounds are proposed as part of the development. Each would have a footprint of 5,000 m2 (c 50m x 100m). The construction compounds would consist of temporary site offices, staff facilities and a car parking area for staff/visitors. The layout of the compounds is shown on Figures 4.17 to Figure 4.21. Construction materials and turbine components would be brought directly to the proposed turbine locations following their delivery to the site. Temporary port-a-loo toilets located within a staff portacabin would be used during the construction phase. Wastewater from toilets would be directed to a sealed storage tank with all wastewater being tankered off site.
- Temporary security cabins would be installed during the construction phase and would be located close to the eastern and western construction site entrances off the N62. The cabins would be prefabricated structures and would be removed following commissioning of the wind farm.

The proposed development site would be accessed via the existing site entrances off the N62, R357 and L7009 (local Stonestown Road). The main entrance for the construction phase would be off the N62. The access off the R357 would be used for the substation and grid connection works only.

There will be a requirement for sand and stone for construction. The estimated volumes are set out in Table 4.2 of the EIAR and Fig 4.23 provides details of local quarries where material can be sourced. Peat and spoil will also require management and an estimate of the quantities is provided in Table 4.3. The methodology for management is set out in a Peat and Spoil Management Plan contained in Appendix 4.2.

The application is supported by an Environmental Impact Assessment Report (EIAR) a Natura Impact Statement (NIS), and accompanying documents, plans and particulars.

The application is also supported by letters of consent from relevant landowners.

4.0 Submissions

4.1. Prescribed Bodies

Irish Water

- The proposed development has the potential to impact an Irish Water Drinking Water Source at Shannon River Intake, located 4.2km to the west on the Lower Shannon River. There is hydrological connectivity between the proposed development and surrounding Special Protection Areas via watercourses within and adjacent to the site boundary that flow into the River Shannon.
- The proposed development poses a risk to the Banagher Public Water Supply and potential negative impacts on water quality through the run-off of silt, hydrocarbons, cementitious materials during the construction, operational and decommissioning phase of the development.
- Further information is required on the measures to be taken to ensure that there will be no direct negative impact on Irish Water's Drinking Water Source during each phase of the development.

- There is infrastructure within the proposed boundary and accordingly the applicant is required to submit a diversion enquiry to Irish Water. The outcome of the diversion enquiry shall be provided as evidence of the further information request.
- Where any temporary/permanent connection to a public water/wastewater network operated by Irish Water is proposed, the applicant must sign an agreement with Irish Water prior to the commencement of the development.

Transport Infrastructure Ireland

- Primary means of access is provided by at grade junctions to the east and west side of the N62, utilising private access junctions. A 100kph speed limit applies to the national road at this location.
- Remote from the windfarm development area, works are proposed relating to the construction of a temporary road bypass of the N62/N52 national road junction. Offaly Co Council has recently granted planning permission (19/404) for amendment to an existing windfarm development proposal which also includes temporary works to the N52/N62. The implementation of two separate proposals has the potential to create driver confusion and impact on the legibility of the national road junction, both temporary and long term, resulting in significant road safety concerns. A coordinated approach is necessary to avoid a piecemeal approach to development and an adverse impact on the national road network in the area.
- The applicant proposes a permanent underpass of the N62. TII would be supportive of an underpass on a national road where it results in a reduction in turning and/or crossing movements traversing the national road carriageway. All structures proposed on the national road network are required to obtain Technical Acceptance from TII, which has no record of any requests or submission as required in relation to the proposed works. The current application has limited details pertaining to the proposed structure and associated safety barriers to permit the TII to evaluate the adequateness of the proposal. Technical Acceptance of the proposed structure in accordance with the requirements of TII Publications DN-STR-03001 should be determined prior to a decision being made on the application.

- Following TII Technical Acceptance of the structure in accordance with TII Publication DN-STR-03001, the Authority recommends the planning authority address the following matters:
    - An appropriate bond shall be in place to ensure satisfactory completion of the works.
    - A monitoring and inspection regime of the structure shall be agreed with the Council and incorporated as a condition in any grant of permission concerning the future management and maintenance of the structure.
- In relation to undertaking such works on the N62, the Board will be aware of the particular circumstances of the road structure from the assessment of the Offaly Co. Council planning file 18/230 currently subject to appeal under case PL 19.304056 and therefore, the importance of appropriately resolving this matter.
- Road Safety Audit(s) where required, should be undertaken prior to a decision on the application so that any recommendations arising can be incorporated as planning conditions of any grant of permission. While there is no objection in principle to the proposed development, a number of issues require resolution prior to a decision being made on this application.
- TII requests that the Board considers the access proposals to the N62 national road in the context of the provisions of official policy and the intensification of use that may arise, to ensure road safety to all users and the application of standards for national roads included in TII publications. There is no objection in principle to the temporary use of existing access junctions for turbine component delivery for the duration of the construction phase of development subject to upgraded junction design in accordance with TII Publications and the application of road safety requirements and standards on the national road.
- With regard to the new junction by pass road to bypass the existing N52/N62 junction, it is noted in the EIAR that this road will be closed and would only be used again in the event that an oversized delivery was required for turbine maintenance purposes. It is considered that retaining the gates on the

temporary road, even after reseeding the road, may generate pressure for other intermittent access requirements, potentially by third parties. It is considered that this access, close to an existing highly trafficked junction of two national roads, should be closed following completion of the construction phase of the development and in the adherence to official policy.

- The proposed turbine haul route includes the M4/M6, national primary roads, to Kilbeggan M6 Junction 5 and south on the N52/N62. It is recommended that the applicant/scheme promoter consult with the relevant road authorities, MMaRC Contractor and PPP Companies on any works proposed that affect national roads and associated junctions in terms of operational requirements such as delivery timetabling, potential costs and associated requirements prior to commencement of any development permitted. From review of the application documents this consultation does not appear to have occurred.
- Any works to facilitate turbine components and any other abnormal loads, including reinstatement works, to existing junctions on the national roads network shall comply with the standards outlined in TII Publications and shall be subject to Road Safety Audit as appropriate. Subject to the outcome of the Road Safety Audit, the Authority has no objection in principle to proposals and this matter should be addressed prior to a decision being made on the application.
- It is recommended that the mitigation included in the EIAR is included as conditions in any permission granted in the interests of safeguarding the strategic function and safety of the national road network in the area.
- All structures on the proposed haul road should be checked by the applicant/developer to confirm their capacity to accommodate any abnormal load proposed. Having reviewed the EIAR documentation TII is concerned that no technical load assessment of structures appears to have been undertaken. However, it is acknowledged that abnormal weight loads may not be a feature of turbine delivery.
- The Authority considers that it is critical that a full assessment by the applicant/developer of all structures on the national road network along the haul route should be undertaken and relevant road authorities along the

routes should confirm their acceptance of proposals by the applicant. The Authority requests referral of all proposals agreed between the road authorities and the applicant impacting on national roads.

- A crossing of the N62 will be required to connect the windfarm proposals on the west side to those on the east side of the national road to facilitate national grid connection. It is noted that the application does not appear to propose any grid connection routing along the national road corridor. Implications relating to cable routing along the N62 national road corridor are identified in the planning decision issued by Offaly Co Council under file Ref No 18/230. A licence may be required from the road authority for any trenching or cabling proposals crossing the national road. The Authority requests referral of all proposals agreed and licensed between the road authority and the applicant which affect national roads.
- TII has no objection in principle to the windfarm development subject to clarification and/or resolution of the issued highlighted above before any decision is made on the application.

Inland Fisheries Ireland

- Any instream works or works that may impact directly on a watercourse should only be carried out between July 1st to September 30th in each year so as to avoid impacting on the aquatic habitat during the spawning season. Appropriate scheduling of works should be facilitated.
- IFI seeks clarification that the current planned windfarm and siting of turbines and road network will not affect future works to restore the Little (Cloghan) River and other associated tributaries on the site to good ecological status.
- The latest EPA Q-value results show water quality in the area to range from Q4-5 to Q4 on the Silver River. It is imperative that all mitigation measures are in place in full and there is proven to be no impact to water quality during construction or during the lifetime of the wind farm.
- It is particularly important during the construction phase that sufficient retention time in the settlement ponds is available to ensure that no deleterious matter is discharged to drainage or surface waters. IFI

recommends that settlement ponds are maintained, where appropriate, during the operational phase to allow for the adequate settlement of suspended solids and sediments and to prevent any deleterious matter from discharging.

- In constructing and designing silt traps particular attention should be paid to rainfall levels and intensity. The silt traps should be designed to minimise the movement of silt especially during intense precipitation events where the trap may be hydrologically overloaded. It is essential that they are located with good access to facilitate monitoring sampling and maintenance. Turbidity monitoring should take place at the trap inlets to allow the maximum time for control and mitigation measures to be put in place where silt laden waters are entering the traps.
- The use of sedimentary rocks, such as shale, in road construction should be avoided. This type of material has poor tensile strength and is liable to be crushed by heavy vehicles, releasing fine sediment materials into the drainage system which are difficult to precipitate and may give rise to water pollution. Details of any road-crossing should be agreed in advance with IFI.
- The silt arising from the loss of peat material to the river is having a detrimental impact on water quality in the stream running through the site and this is likely to exacerbate any in-combination impacts the proposed windfarm will have on the river. This works should ensure that a sufficient buffer zone is established to the streams and allow for regeneration of a protective riparian zone. IFI would like to see a rehabilitation plan for the Little (Cloghan) River included as part of the overall biodiversity management plan.
- The final contractor CEMP and environmental management plan should be agreed in advance with IFI and include post-construction monitoring. All mitigation measures should be identified and stipulated in tender documents and mitigation measures required should be in place prior to commencement of the works.
- Recommends that standards best practice mitigation measures be employed to protect ground and surface water.

Irish Aviation Authority

The Irish Aviation Authority notes that the proposed wind farm is within Wolftrap DME Flight inspection orbit and might have adverse effect on flight inspection procedures and profile. It recommends that the developer engage a third-party company to complete the assessment.

Department of Culture, Heritage and the Gaeltacht

Archaeology

The proposed development is located within an area rich in archaeological remains and there is potential for the discovery of archaeological material during the construction of the proposed wind farm. Conditions are recommended to protect the archaeological resource in the event of a grant of permission.

Nature Conservation

The EIA Directive requires consideration of the 'do-nothing scenario' and requires the assessment of the evolution of the baseline environmental conditions i.e. how the situation would be expected to develop over time (rather than a static description of the state of the environment at the time of the assessment). It should be supported by available environmental information and scientific knowledge. Similar provision is included in the Planning and Development Regulations, 2001-2019.

The Biodiversity chapter of the EIAR states that in the 'do-nothing' scenario, '*the biodiversity of the site would remain similar to its current state as activity levels and land use would not change significantly'.* This statement is not supported by any evidence in the EIAR. An accelerated phasing out of peat extraction is now being planned, with Bord Na Mona proposing an enhanced and accelerated rehabilitation programme of some of its bogs. Given these developments, it is not considered appropriate to base the evolution of the site on previous activity and land use. The evolution of baseline environmental conditions are uncertain which may require consideration of a number of 'do-nothing' scenarios in order to fully assess the environmental impacts of this project.

Draft Rehabilitation Plans

It is a requirement of the IPC Licence that the agreed cutaway bog rehabilitation plan be implemented following termination of use or involvement of all or part of the site in

the licensed activity. Appendix 6.8 of the EIAR incorporates draft rehabilitation plans integrated with the windfarm development. No information is provided about the rehabilitation measures which would have been undertaken in the absence of the windfarm development and therefore it is not known if the rehabilitation plans have been undermined by the proposed development. Draft rehabilitation plans prior to integration of the windfarm development for this site, dating back to 2013, are available to the applicant and would have facilitated this process.

The current draft plans are not sufficiently clear and detailed regarding the rehabilitation measures to be undertaken. For example, the plans state that re-wetting of the cutaway is a rehabilitation strategy, but no details are provided on when and where this strategy is to be implemented. No plans are provided showing the extent of lands subject to IPC licensing and where rehabilitation planning is provided. The plans submitted are not sufficiently detailed and it should be a condition of any planning permission that a revised Rehabilitation Plan is provided.

The Rehabilitation Plan should encompass the entire site and not just those parts which are subject to IPC licensing. The Plan should outline the rehabilitation measures to be undertaken. Consideration should be given to enhanced rehabilitation measures (beyond those necessary for compliance with Condition 10.1 of the IPC licence) that could be implemented in tandem with the project's construction, operational and decommissioning stages. Such measures would aim to implement significant interventions which would optimise the establishment of wetland habitats.

As well as supporting biodiversity, wetland habitat restoration has the potential to deliver ecosystem services such as climate change mitigation, provision of clean water and water regulation as well as cultural services such as nature-based amenity provision and preservation of in-situ archaeological services.

Successful implementation of enhanced measures would require significant planning and design using modelling with regard to the site's topography and hydrology and must avoid any impacts to adjacent land. This approach would be in accordance with the National Peatlands Strategy 2015, the River Basin Management Plan 2018-2021, the National Biodiversity Action Plan 2017-2021 and the Climate Action Plan

2019. The Department is available to provide advice on the development of such a rehabilitation plan.

Carbon balance of the site

Section 10.2.4.1 of Chapter 10 (Air and Climate) outlines the 'do-nothing' effect in relation to habitat development and carbon balance of the site. It states that the proposed wind farm development will be integrated into the rehabilitation plans for the bogs and will not therefore have a significant impact on the plans for rehabilitation in the 'Do-Nothing' scenario with respect to carbon balance on the site. No evidence is provided to support this. Peat carbon losses are calculated on the area of peat disturbed (17.33ha) and redistributed (21.66ha) only (Appendix 12.1 of the EIAR). They do not account for carbon losses or savings due to future peatland rehabilitation of areas of the site subject to IPC licensing in the 'do-nothing' scenario (over the 30 year lifecycle of the project) and the impact of the project on these. The calculations appear to be based on 24 turbines and not 21 as proposed and may not therefore be accurate.

Disturbance Impacts on Bird Species

There are concerns in relation to the impacts of amenity provision on ground nesting birds and roosting hen harriers within the site. The ornithological surveys have recorded various ground-nesting bird species to be breeding or possibly breeding within the development site and two occasional hen harrier roost sites, one within and one adjacent to the proposed development site. All species listed are considered Key Ornithological Receptors (species occurring within the zone of influence of the development upon which likely significant effects are anticipated and assessed).

Currently the site has no formal recreational access or facilities. The proposal includes c 18km of amenity pathways, the provision of amenity access and pathways providing linkages to the wider area and existing/proposed walkways. The recreational disturbance impacts of the proposed recreational amenities have not been assessed. Studies have shown that recreational disturbance can lead to the avoidance of certain areas by birds which can impact on breeding success and survival. Dog walking is identified as a main cause of disturbance and should be a focus for assessment.

Apart from locating pathways away from some wetland areas, no details have been provided on how impacts to ground-nesting birds have been avoided through project design. The proven effectiveness of proposals to implement dog control measures in reducing impacts on ground nesting birds is not provided. Disturbance to ground nesting birds by walkers and in particular dog walkers may require to be monitored during the operational phase of the development.

Impacts on existing drainage systems on water dependent ecological receptors

The EIAR states that the proposed drainage system will be fully integrated into the existing bog drainage systems. No assessment has been made of the cumulative impacts of the existing drainage network/proposed network on water dependent ecological receptors, such as fish species and aquatic invertebrates.

The Silver River is the major watercourse in the vicinity of the proposed development. It supports 'Croneen' trout, a genetically distinct population of the brown trout indigenous to Lough Derg and its tributaries. The river also supports white-clawed crayfish, brook lamprey and Atlantic salmon. The Little (Cloghan) River flows in a north-westerly direction through the centre of the proposed development site and crosses the N62 approximately 1.5km north of the Derrinlough Briquette Factory. In 1999, the date of the most recent EPA reading, the Q value was recorded as Poor(Q2-3). Seven out of the 8 water bodies sampled in the vicinity of the proposed development as part of the Aquatic and Fisheries Report had biological water quality values of Q2-3 or Q3 (poor status).

Ammonia readings taken from surface water sampling points on water bodies around the site exceed the standard that is required to support Good Ecological Status. There is evidence from targeted water quality monitoring data that ammonium concentrations downstream of modified peatlands can be very high and water bodies adjacent to this site, including the Silver River and the Little (Cloghan) River, have been mapped as 'At Risk Water Bodies where Peat is a Significant Pressure'.

Upgrading and improvement of existing water treatment elements such as in-line controls and treatment systems including silt traps and settlement ponds are proposed for the proposed drainage system. The impacts of existing drainage systems on water dependent ecological receptors should be considered, in the absence of such measures, cumulatively with the impacts of the proposed drainage

scheme. Water quality monitoring data required for IPC licensing is available to the applicant and could be used for this purpose.

Measures included in the Biodiversity Management Plan (Appendix 6.7)

It is stated that the construction of the proposed windfarm and associated infrastructure will result in the direct loss of c 32.38 ha of revegetated cutover bog which is developing as pioneer poor fen, heath type habitats, bog woodlands and scrub and that there is potential to result in indirect effects on the habitats immediately adjoining the footprint through drainage. The mitigation section states that the proposed development provides for the ecological enhancement of areas of cutover bog through rewetting to promote the development of wetland vegetation and that the measures are fully described in the Biodiversity Management Plan provided in Appendix 6.7. The management plan contains no measures to ecologically enhance areas of cutover bog through rewetting. Therefore, residual effects on cutover bog remain.

The Biodiversity Plan includes a proposal to plant c.13 ha of native woodland in areas dominated by bare peat to off-set the loss of 7.4 ha of non-Annex 1 birch woodland and scrub. The Department questions the need to introduce this measure given that both birch dominated woodland and birch scrub occur throughout much of the site where peat production has ceased and the area of this habitat is likely to increase through natural regeneration and succession.

Lepidoptera Management Plan (Appendix 6.6)

Construction phase measures in the Lepidoptera Management plan include the side casting of material to the opposite side of the proposed infrastructure to where march fritillary habitat occurs and the use of calcareous sub-peat during reinstatement along the infrastructure corridor of the site. Such measures may have significant impacts on the site's hydrology and hydrogeology and conflict with planned restoration of the site through rewetting. Marsh fritillary habitat has been assessed as stable and its range and population are increasing in the short term.

Marsh fritillary conservation is dependent on active management of vegetation with optimum mean vegetation height being 25cm. Neither the Biodiversity section of the EIAR nor the Lepidoptera Management Plan includes a description of the current management practices at current occupied sites and likelihood of such management

continuing. This should be included in the assessment and detailed future management measures included in the EIAR, if required.

Impacts of Aviation and other lighting on biodiversity, in particular bat species

An assessment of the impacts of aviation lighting have not been included in the Biodiversity chapter of the EIAR or in the Bat Survey Report in Appendix 6.2. Measures to minimise the harmful effects of lighting have been included in the Bat Survey Report. In addition to these measures to 'trim and dim' light using light sensors and controls should also be considered. Lighting in the project should consider best practice guidance such as Dark Sky Ireland Lighting Recommendations. Lighting should avoid LED light which peaks in the blue spectrum as this can have negative impacts on biodiversity.

Matters relating to Appropriate Assessment and Natura Impact Statement

The proposed development site is indirectly connected via surface water to the River Shannon Callows SAC and the Middle Shannon Callows SPA. It is stated in the EIAR that the proposed drainage system will be fully integrated into the existing bog drainage systems. No assessment has been made regarding the in-combination impacts of the existing/proposed network on the Qualifying Interests and SCI in the NIS. Further information may be required in relation to this matter in order to reach a reasoned conclusion regarding the impact of the proposed project on the environment and to the assessment of impacts on European sites.

Geological Survey Ireland

Geoheritage

Records show that there are multiple County Geological Sites (CGS) in Co. Offaly. Within the development area there are numerous locations of the geological features 'Mushroom rocks'. The Kilcormac Esker system lies to the south of the proposed windfarm development. Attention should be given to the possible impacts of the proposed development on the integrity of current CGS's.

Geohazards

Geohazards can cause widespread damage to landscapes, wildlife, human property and human life. It is recommended that geohazards be taken into consideration,

especially when developing areas where risks and susceptibility are prevalent, and that Geological Survey Ireland (GSI) data be used when doing so.

Groundwater

Through its Groundwater Programme, GSI provides advice and maps on groundwater quality, quantity and distribution. With regard to Flood Risk Management there is a need to identify areas for integrated constructed wetlands and the GSI's National Aquifer and Recharge maps should be used to this end.

It is recommended that the GSI's Geotechnical Map Viewer be consulted as part of any baseline geological assessment of the proposed development as it can provide invaluable baseline data for the region or vicinity of the proposed development area.

Environmental Protection Agency

- Bord Na Mona informed the EPA in February 2021 that it had ceased all peat extraction activity on the bogs.
- The IPC Licence (P0500-01) may need to be reviewed or amended to accommodate the changes proposed in the planning application.
- The IPC Licence conditions remain in place for any activity on site, including the construction phase of the wind farm, until such time as the EPA approves surrender of the licence. This includes the management of silt/settlement ponds and any emission limit values and agreed trigger levels for discharges to surface water.
- Rehabilitation is the first stage in the licence surrender process. Condition No 10 of IPC Licence P0500-01requires rehabilitation plan(s) to be prepared. Draft rehabilitation plans for Drinagh and Clongawny bogs were updated by the licensee in the 2019 Annual Environmental Report (AER) for P0500-01 to take account of the proposed windfarm development.
- As part of its consideration of any licence application or licence review application that may be received which addresses the changes proposed, the Agency will ensure that before a license is granted the licence application will be made subject to an Environmental Impact Assessment as respects the matters that come within the functions of the Agency in accordance with section 83 (2A) and section 87(1G)(a) of the EPA Act.

- Should a licence application or a licence review application be received by the Agency, all matters to do with environmental emissions to the environment from the activities proposed, the licence application documents and the EIAR will be considered by the Board.
- Where the Agency is of the opinion that the activities as proposed, cannot be carried on, or cannot be effectively regulated under a license then the agency cannot grant a licence for such an activity.
- The EPA cannot issue a Proposed Determination on a licence application until a planning decision has been made.

4.2. **Observers**

In response to the application, submissions were received from 17 no. observers which are on file for the Board's information. The main issues raised relate to:

- Concerns in relation to the noise levels associated with the proposal and potential cumulative impacts when taken in conjunction with the existing Meenwaun and proposed Cloghan wind farms.
- On-going noise issues with Meenwaun wind farm.
- Accuracy of noise modelling and impacts on local residents.
- Potential for wake effects and effects on the operational efficiency and safety of Cloghan wind farm.
- Ownership issues and access rights within the application site.
- Visual impacts and cumulative effects in association with existing/permitted developments.
- Height of proposed turbines relative to those existing and permitted in the area.
- Impacts on residential amenity and property values.
- Taken in conjunction with existing and permitted wind farms the proposal will result in residents being surrounded by turbines. The landscape has no capacity to absorb the development.
- Limited consultation with local residents.

- Impacts on human health arising from the generation of ultrasound and low frequency noise.
- Impacts on livestock and animals from low frequency noise.
- Fire risk associated with the proposed development.
- Concerns with regard to the safety of the turbines on the public.
- Negative impacts on Drinagh Wetlands and European Sites.
- Negative impacts on ground water quality.
- Negative impacts on the N62 National Secondary Road.
- Archaeology and heritage of the bog will be impacted by the development.
- The development will not result in a significant reduction in CO2 levels and will not be of economic value to the area.
- The photomontages do not accurately illustrate the cumulative visual impact of the proposed development with existing/proposed wind farms.
- Inconsistencies in landscape and visual assessment. Landscape assessment

Planning Authority

The Chief Executives Report describes the proposed development, the site location and surroundings. It describes relevant policy/guidance documents, landscape designations/listed views and European/National designations in the vicinity of the site. The report also provides an overview of the EIAR and summarises the main mitigation measures and conclusions under the various environmental topics.

The report also details separate technical reports which are summarised below:

Road Design & Area Engineer's Report notes that abnormal loads will be associated with the delivery of each turbine and transport of cranes for installation. There will also be increased traffic associated with the construction stage and potential damage to the road network. In addition to the mitigation measures set out in the EIAR, the report sets out detailed requirements in the event of approval being granted for the development.

Environmental & Water Services Report – considers that the application is unsatisfactory with regard to information provided on noise, hydrology and

hydrogeology, population and human health, biodiversity, ornithology, landscape and visual impact.

The planning authority assessment concluded that the principle of the wind farm is acceptable and largely complies with the policies and objectives of the current county development plan. However, a number of turbines are located outside the area designated for wind farm development in the Wind Energy Strategy (WES). This represents a material contravention of the plan. The turbines located outside the designated area should be omitted from the development.

With regard to turbine design, the Board is advised to consider the ratio of rotor diameter to hub height. A ratio of 1:1 gives rise to a typical tall, slender and proportional appearance of the turbines. In this case the ratio of tip height to hub height is more in the order of 1.4:1. This is considered relevant given the proximity of the proposed wind farm to the other permitted developments and the difference in the tip and hub heights between the developments may impact on the visual order and the legibility of the developments when viewed in the landscape. It is unclear if the amended height permitted to the Cloghan Wind Farm has been taken into account in the photomontages. Issues are raised regarding the quality of the photomontages received with the application.

The planning authority has concerns regarding the cumulative visual impact of the proposal when taken in conjunction with other wind farms in this location. It is considered that if the turbines that are located within the area which is not designated were omitted, the spatial extent of the turbines would be reduced, in particular from viewpoints VP3, VP4, VP5, VP10, VP12 and would alleviate some of the concerns regarding cumulative impacts.

Cumulative noise impacts are of concern to the planning authority. The documentation does not allow for easy identification of dwellings when reviewed against the tables presented. Further detail is required with respect to the attenuation and curtailment measures specified. The indicative Curtailment Strategy Matrix should to central to the noise mitigation measures, and should the Board consider granting approval for the development extensive and on-going operational noise monitoring should be required by condition. Clarification is also required with respect to specific curtailment measures at the various NSL’s. The Draft Revised Wind

Energy Development guidelines are more stringent in this regard and should be taken into account.

Further clarification is required in respect to a number of matters including details of which turbines would be required to operate in noise reduction mode, why background date from the Meewaun Windfarm EIS was not used, confirmation which, if any, dwellings are in the ownership of individuals financially involved in the wind farm. The applicant's proposal to confirm predicted exceedances at the commissioning stage is considered to be inadequate.

The report seeks clarification on a number of issues relating to the shadow flicker assessment. It is considered that the mitigation proposed is likely to be adequate to address the potential adverse impacts on residential properties. The use of a SCADA control system should be the preferred method to mitigate shadow flicker, if established as an issue at a residential property.

The proposed permanent anemometry monitoring masts should be limited to the duration of any permission and the applicant should be requested to sharing to minimise the need for such masts in the area. The grid connection location and arrangement are considered acceptable.

Further details are required on the Community Gain Fund in relation to the breakdown for the various funding elements and the specifics of actual implementation and selection criteria.

Offaly Co Council Development Contribution Scheme identifies a development contribution of €10,000 per MW of capacity. The Council is unable at this stage to specify whether any special contribution would be necessary for the proposal. The Council's preference would be for a very specific road condition in the event of approval requiring pre surveying of affected roads, proposals for rendering the routes fit for purpose, ongoing monitoring and repair during the projects, post construction surveys and remedial works. While the Wind Energy Development Guidelines 2006 recommend that planning authorities do not attach a bond for decommissioning, the Roads Section have recommended a bond be attached with the amount of the bond in the region of the coast of the overlay of the national and local routes for the construction routes. This shall be agreed with Offaly Co Council prior to the commencement of the development.

The report recommended conditions.

5.0 Planning History

The applicant provided the following details of applications for planning permission both on the site and in the wider environment, including other wind energy developments.

Within the subject site the main applications related to infrastructure/buildings associated with Bord Na Mona operation, retention of a 30m telecommunications mast and for the erection of a wind monitoring mast (Ref No 17/155).

The applicant also provides details of planning applications in the wider locality, which are set out in Table 2.1 of the EIAR. The majority relate to domestic type development, and there are also some agricultural proposals. Details of commercial and utility developments in the wider area include the following:

Reg Ref 19 PA0015 – Permission granted by An Bord Pleanala on March 12th, 2010 to Lumcloon Energy for a gas fired electricity generating station capable of producing up to a maximum of 350MW at Lumcloon, Cloghan Ferbane. Co Offaly, c 5.5km east of Cloghan and to the north of the subject site.

Reg Ref 17/194 – Planning permission granted on 25/7/17 to Lumcloon Energy for the development of an energy storage facility designed to provide 100MW of system support services to the electricity grid. The permission was subsequently superseded by Reg Ref 19/55 for alterations to the permitted development, which was granted on 7/8/19.

Reg Ref 12/65 – Permission granted for an anemometer mast (Galetech Energy Development Ltd).

Reg Ref 18/230 – The decision by Offaly Co Council to refuse permission for the installation of c12.5km of 38kV transmission line from permitted wind farm substation in Stonestown Co Offaly to the existing substation at Clondallow Co Offaly was recently granted under appeal (ABP-304056-19).

Reg Ref 19/555 – Permission granted to Galetech Energy Development Cloghan Ltd for the installation of c 8km of underground electricity line with a capacity of up to 38kV from permitted windfarm substation in the townland of Stonestown to the

permitted substation in the townland of Lumcloon Co Offaly (14/188 & PL19.244053).

The applicant provides details of other windfarm applications within a 20km radius of the EIAR study area. The following were granted permission:

Reg Ref 02/734 – Application made by New Energy Technologies Ltd for the erection of 5 no. wind turbines, a meteorological mast, associated access roads and control building. Conditional permission granted on 30/10/02.

Reg Ref 10/130 – Application made by Gaelectric Development Ltd for the construction of 2 no. turbines (hub height not exceeding 85m, blade diameter not exceeding 80m) and all associated site works to the north of the R357 in Rin Td. Conditional permission granted on 2/7/10 [Constructed]

Reg Ref 14/188 – Planning application made by Gaelectric Development Cloghan Ltd for the erection of 9 no. wind turbines each with a hub height of up to 100m, a typical rotor diameter of 103m (overall maximum tip height of up to 150m) and all associated site development works. Conditional permission granted (PL 19.244053). The site lies to the north of the briquette factory and between the N62 and Drinagh Bog.

Reg Ref 19/404 – Application by Gaeltech Energy Developments Cloghan Ltd for amendments to the development permitted under 14/188 including an increase in overall turbine height from 150m to 169m, re-siting of turbines and realignment of wind farm access roads, increase in height of the meteorological mast, temporary upgrade of the N52/N62 junction at Kenneddy's Cross and all associated site works. The planning authority issued a decision to grant permission subject to conditions on 12/3/20. A subsequent appeal to An Bord Pleanala (ABP-307266-20) was withdrawn.

Reg Ref 15/44 – Planning application made by Meenwaun Wind Farm for a wind farm comprising up to 5 no. turbines with a maximum tip height of up to 169m and associated works. Condition permission granted (PL 19.244903). The site lies to the south west of Clongawny Bog. Four turbines have been erected.

Reg Ref 20/45 -Permission refused for 2 no. Turbines on lands to the south of the site. The decision was upheld in a subsequent appeal (ABP 307392) on the grounds

that the site is located outside the area open for consideration for wind energy development in the current Offaly County Development.

The applicant notes the following applications made in **Co Tipperary**:

Reg Ref No 5123496 – Planning application made by T and G Armitage for 3 no. wind turbines, service roadways and control house to the south west of Birr. Co Offaly. Conditional permission granted on 24/6/01.

Reg Ref No 5123495 – Planning application made by N and R Alexander for 5 no. wind turbines, access roadway and control house to the south west of Birr in Co Offaly. Conditional permission granted on 25/5/01.

5.1. **Other relevant consents**

The site remains regulated under EPA IPC Licence No P0500-01, which licensed the extraction of peat on the site.

Condition No 10 requires the implementation of an agreed cutaway bog rehabilitation plan. The requirements are as follows:

It is a requirement of the licence that Rehabilitation Plan shall include as a minimum, the following:

- *A scope statement for the plan, to include outcomes of consultations with relevant Agencies, Authorities and affected parties (to be identified by the licensee).*
- *The criteria which define the successful rehabilitation of the activity or part thereof, which ensures minimum impact to the environment.*
- *A programme to achieve the stated criteria.*
- *Where relevant, a test programme to demonstrate the successful implementation of the rehabilitation plan.*
- *A programme for aftercare and maintenance*

It is a requirement that final validation report to include a certificate of completion for the Rehabilitation Plan, for all or part of the site as necessary, shall be submitted to the Agency within six months of execution of the plan. The licensee shall carry out such tests, investigations or submit certification, as requested by the Agency, to confirm that there is no continuing risk to the environment.

6.0 Further Information

Further information was sought from the applicant on August 14th, 2020. The applicant was requested to address the matters raised in the submissions from the planning authority, prescribed bodies and observers, to submit a revised photomontage booklet and additional photomontages and clarify matters in relation to the noise assessment.

The response was received on September 24th, 2020. Further submissions were received from Offaly Co Council, TII and the from 5 no. observers. These are considered in more detail in the Assessment section of this report.

7.0 Legislative & Policy Context

Introduction

Chapter 2 of the EIAR sets out details of international and national climate change policy, targets, and guidelines and the strategic planning context for the proposed development. There is a continually evolving international, European and national policy supporting the development of renewable energy projects to enable transition to a low carbon energy economy and to meet international obligations to address climate change.

EU Legislation/Policy

<u>European Union Directive on the Promotion of the Use of Energy from Renewable Sources (Directive 2009/28/EC)</u>

The European Union Directive on the Promotion of the Use of Energy from Renewable Sources (Directive 2009/28/EC) was adopted on 23rd April 2009. It establishes the "20-20-20" targets:

- a minimum 20% reduction in greenhouse gas emissions based on 1990 levels,
- 20% of overall EU energy consumption to come from renewable sources by 2020,
- 20% reduction in primary energy use compared with projected levels to be achieved by improving energy efficiency.

Under the terms of the Directive, each Member State is set an individually binding renewable energy target, which will contribute to the achievement of the overall EU goal. The Directive legally obliges each Member State to ensure that the target is met. It further requires that each Member State publish a national renewable energy action plan outlining how these binding commitments would be met and to submit the plan to the European commission.

The 2020 target for Ireland is to source 16% of all energy consumed from renewable resources. This will be met by 40% from renewable electricity, 12% from renewable heat and 10% from the renewable transport sector. The pathways to achieve this are set out in the National Renewable Energy Action Plan.

Climate and Energy Policy Framework 2030

The Climate and Energy Policy Framework 2030 was adopted in 2014 and includes EU-wide targets and policy objectives for the period between 2021-2030. It seeks to drive continued progress towards a low-carbon economy and build a competitive and secure energy system that ensures affordable energy for all consumers and increase the security of supply of the EU's energy supply. It sets targets of at least 40% reduction in green-house gas emissions and at least 23% share of renewable energy from all energy consumed in the EU by 2030.

The Effort Sharing Regulation (EU) 2018/842 lays down obligations on Member States with respect to minimum requirements to fulfil the EU's target of reducing its greenhouse gas emissions 30% below 2005 levels in 2030 in the various sectors and contributes to achieving the objectives of the Paris Agreement. A GHG reduction target of at least 30% applies to Ireland.

Revised Renewable Energy Directive 2018/2001/EU (January 2019)

It sets out a new target for share of energy from renewable sources in the EU to at least 32% for 2030, with a review for increasing this target through legislation by 2023. A major shift within the revision is the way in which Member States will contribute to the overall EU goal. Where previously (for 2020 target) member states had an individual national binding target, the 2030 framework is solely based on an EU-level binding target of 32 per cent. It requires Member States to set national contributions to meet the binding target as part of their integrated national energy and climate plans.

National Legislation/Policy

National Renewable Energy Action Plan

The Renewable Energy Directive (Directive 2009/28/EC) was transposed into Irish law by the European Union (Renewable Energy) Regulations 2014. Under its requirements the National Renewable Action Plan (NREAP) was submitted to the European Commission in 2010. It sets out the Government's strategic approach and measures to deliver on Ireland's 16% target by 2020. In relation to wind energy, the NREAP states:

'Ireland has immense potential for the development of renewable energy particularly wind energy, both on and offshore and wave energy. The development and expansion of the use of renewable energy, together with measures aimed at a reduction and more efficient use of energy are important as regards meeting our climate change objectives and priorities, both nationally and at European level. At a high level a significant increase in renewable energy and the protection of the environment are thus mutually reinforcing goals.'

Under the requirement of Directive 2009/28/EC, all Member States must submit a progress report to the European Commission every two tears, with the final report by 31 December 2021. To date, Ireland has submitted four progress report, the most recent in February 2018.

Irelands Transition to a Low Carbon Energy Future 2015-2030

A Government White Paper entitled *'Irelands Transition to a Low Carbon Energy Future 2015-2030'* was published in December 2015. It was developed to guide policy and actions that the Government intends to take in the energy sector up to 2030 and reaching out to 2050, to ensure a low carbon future that maintains Ireland's competitiveness and ensures a supply of affordable energy.

It acknowledges that a radical transformation of Ireland's energy sector is required to meet climate change objectives. A low carbon future would involve, inter alia, greater use of electricity from renewable sources of which the country has a plentiful supply and greater use of electricity for heating and as a fuel for transport. The White Paper repeats the target of generating 40% of the country's electricity from renewable sources by 2020.

It envisages on-shore wind driven plants continuing to be the main contributor to renewable electricity. It is stated in Chapter 4 that to achieve the target in relation to renewable energy the average rate of build of on-shore wind generation will need to increase up to 260MW per year from the current rate of 170MW. A total of 3500-4000MW on-shore renewable electricity is required in comparison to the December 2015 figure of 2500MW.

It confirmed that onshore wind is the cheapest form of renewable energy in Ireland, stating that it is:

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

Strategy for Renewable Energy 2012-2020

The Strategy for Renewable Energy 2012-2020, published by the DCENR in May 2012 outlines the strategic goals which underpin the Government's energy and policy objectives. It outlines the key actions to be undertaken to support the development of each of the renewable energy sectors to deliver on Ireland's binding 2020 targets under the Directive. It sets out five strategic goals, which includes

Strategic Goal 1 – Progressively more renewable electricity from onshore and offshore wind power for the domestic and export markets.

Project Ireland 2040 - The National Planning Framework

Project Ireland 2040 - The National Planning Framework (NPF) which was published in 2018 is a strategic plan to guide development and investment out to 2040. It is envisaged that the population of the country will increase by up to 1 million by that date and the strategy seeks to plan for the demands that growth will place on the environment and the social and economic fabric of the country.

The Plan sets out 10 goals, referred to as National Strategic Outcomes. One of the key goals (National Strategic Outcome 8) is that of 'Transition to a Low Carbon and Climate Resilient Society'. It acknowledges that Ireland's energy policy is focussed on the pillars of sustainability, security of supply and competitiveness. It is stated:

"In the energy sector, transition to a low carbon economy from renewable sources of energy is an integral part of Ireland's climate change strategy and renewable energies are a means of reducing our reliance on fossil fuels".

It is an objective that:

"40% of our electricity need will be delivered from renewable sources by 2020 with a strategic aim to increase renewable deployment in line with EU targets and national policy objectives out to 2030 and beyond".

National Policy Objective 55 states:

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

National Mitigation Plan 2017

The National Mitigation Plan was published in July 2017 as required under the Climate Action and Low Carbon Development Act 2017. It outlines a range of measures to lay the foundations for transitioning Ireland to a low carbon, climate resilient and environmentally sustainable economy by 2050. It recognises that Ireland has abundant, diverse and indigenous renewable energy resources which will be critical to decarbonising our energy system, including electricity generation. Onshore wind has to date been the most competitive renewable energy technology in Ireland, accounting for 22.8% of electricity generation in 2015.

With regard to wind energy and meeting targets, the National Mitigation Plan states:

"To date, wind energy has been the largest driver of growth in renewable electricity. The total amount of renewable generation connected to the national grid at December 2016 was 3,120MW, of which wind generation was approximately 2,796 MW, hydro was 238MW and biomass was 86MW. EirGrid estimates that a total of between 3,900MW and 4,300MW of onshore renewable generation capacity will be required to allow Ireland to achieve 40% renewable electricity by 2020. This leaves a further requirement of between 780MW and 1,180MW to be installed by 2020 if the 2020 electricity target is to be reached".

It refers to the quantity of carbon stored in Irish Peatlands (64% of total soil organic carbon stock present) and to the National Peatlands Strategy as setting out how to

sustainably manage and protect/conserve this national resource. It does not include any explicit reference to the potential for peatland restoration/rehabilitation to contribute to climate change mitigation.

Climate Action Plan 2019

The *Climate Action Plan 2019* sets out an ambitious course of action over the coming years to address the impacts which climate change may have on Ireland's environment, society, economic and natural resources. The decarbonising of the electricity sector and harnessing our significant renewable energy resources is a key aspect of the strategy. It sets a target of increasing electricity generated from renewable sources to 70% by 2030 to include offshore renewable energy, solar and increased onshore wind capacity.

Regarding agriculture, forestry and land-use sector, it is proposed to better manage peatlands and soils to deliver carbon abatement from land-use. It is noted that peatlands cover 21% of the State's land area and accounts for 64% of its total soil organic carbon stock, but is very vulnerable to drainage from forestry, grazing and extraction.

Measures to manage this carbon sink include:

- Undertake further research to assess the potential to sequester, store and reduce emissions of carbon through the management, restoration and rehabilitation of peatlands as outlined in the National Peatlands Strategy.
- Develop best-practice guidelines for wetland management, including the management of degraded sites and peatlands currently exploited for energy peat extraction.
- Create additional incentives to adopt carbon-positive, post-production options for Bord na Mona lands, and similar options on other commercial and private peat extraction sites.
- Develop further measures to help rehabilitate exploited and degraded peatlands, including as part of national land use planning and the new CAP, and recognising that the strategies may need to differ between regions.

The Action Plan includes an Annex of Actions:

Action 133 - *Assess and implement mitigation options on post production, peat extraction:* It contains the following sub-actions which are considered relevant:

- Assess the optimum post production after-use across all Bord na Mona peat extraction sites (Bord na Mona Q3, 2019)
- Timely implementation and optimum management practices on extraction sites as they retire from production (Bord na Mona Q3, 2019-ongoing).
- Establish a focused research and development programme to ensure robust National Inventory Systems are in place to report and account LULUCF emissions and removals (EPA, DAFM & Teagasc Q2, 2020) .
- Assess the status and mitigation potential for other commercial and private peat extraction across Ireland (EPA Q4, 2020).

<u>The National Peatlands Strategy 2015-2025 (DAHG, 2015)</u>

The Strategy sets out principles to guide Government policy and to provide a long-term framework for the responsible management of all peatlands to optimise their social, environmental and economic contribution to the State. It proposes that the potential contribution of peatlands rehabilitation, restoration and enhancement to climate change mitigation and adaptation be fully explored, in addition to their potential to contribute to a low carbon economy through use of sites for renewable energy.

The Strategy provides a framework for determining and ensuring the most appropriate future use of cutover and cutaway bogs. It recognises that such bogs have a number of advantages over other categories of land in terms of potential windfarm development of scale.

*'The appropriate development of such bogs may assist energy projects which will contribute to meeting our renewable energy targets and developing an export market for renewable electricity. Windfarms on cutaway bogs could be developed in conjunction with recreational and natural amenity' (*Page 29).

It sets out a number of principles that will be used to guide sectoral policies, plans and decisions regarding the future use of peatlands:

- Ireland's peatlands will continue to be used for many purposes including agriculture, development, peat extraction, forestry, conservation and amenity (P1).
- The potential economic, environmental and social benefits and costs of peatland uses will be considered and applied to policy and land use decisions (P2).
- Semi State companies…and public authorities … discharge their functions in such a way to support the objectives of this Strategy (P5).
- Future management of these State-owned peatlands will be in keeping with the objectives of the Strategy (P12).
- Generally, Bord na Móna cutaway bogs that flood naturally will be permitted to flood unless there is a clear environmental and/or economic case to maintain pumped drainage (P16).
- In deciding on the most appropriate after-use of cutaway peatlands, consideration shall be given to encouraging, where possible, the return to a natural functioning peatland ecosystem. This will require re-wetting of the cutaway peatlands which may lead in time to the restoration of the peatland ecosystem (P17).
- Environmentally, socially and economically viable options should be analysed to plan the future of industrial cutaway peatlands, in conjunction with limiting factors as outlined in Bord na Móna's *'Strategic Framework for the Future Use of Peatlands'* (P18).
- Consideration will be given to how best cutaway bogs can contribute to a low carbon economy through their use as sites for renewable energy (P21).
- Policies and decisions relating to the use of peatlands shall take full consideration of potential impacts on water quality and the attainment by the State of mandatory water quality standards (P25).

Regional Policy

Eastern and Midlands Regional Spatial and Economic Strategy 2019-2031

The Eastern and Midlands Regional Spatial and Economic Strategy 2019-2031 (RSES) came into effect on June 28th, 2019. Its principal purpose is to support the implementation of the NPF and the economic policies and objectives of Government by providing a long-term strategic planning and economic framework for the development of the region. It seeks to determine at a regional scale how best to achieve the shared goals set out in the National Strategic Outcomes of the NPF and sets out 16 Regional Strategic Objectives (RSO's) which set the framework for city and county development plans.

Section 10.3 is devoted to Energy. It states;

'A secure and resilient supply of energy is critical to a well-functioning region, being relied upon for heating, cooling, and to fuel transport, power industry, and generate electricity. With projected increases in population and economic growth, the demand for energy is set to increase in the coming years'.

It is recognised that there is over-reliance on non-indigenous supplies of energy and that there is a need to better leverage natural resources to increase the share of renewable energy.

Relevant objectives include:

RPO 10.20*: Support and facilitate the development of enhanced electricity and gas supplies, and associated networks, to serve the existing and future needs of the Region and facilitate future transmission infrastructure projects that might be brought forward in the lifetime of this Strategy. This includes the delivery of the necessary integration of transmission network requirements to facilitate linkages of renewable energy proposals to the electricity and gas transmission grid in a sustainable and timely manner subject to appropriate environmental assessment and the planning process.*

RPO 10.22*: support the reinforcement and strengthening of the electricity transmission and distribution network to facilitate planned growth and transmission/distribution of a renewable energy focussed generation across the major demand centres to support an island population of 8 million people, including;*

- *Facilitate the delivery of the necessary integration of transmission network requirements to allow linkages of renewable energy proposals to the electricity transmission grid in a sustainable and timely manner.*

Local Policy

Offaly County Development Plan 2014-2020

The operative development plan is the Offaly County Development Plan 2014-2020. Chapter 3 (Energy Strategy) recognises that the county has had a long history of energy production, related predominantly to the commercial exploitation of peatlands. It is acknowledged, and that the energy market is changing, moving to a greater reliance on renewable energy. The Plan recognises the importance of energy to the local economy and that the main developments in the energy industry over the lifetime of the plan will be in generation and the migration from non-renewables to renewables. It supports development of renewable energy in rural areas, where it is considered appropriate, i.e., where it is demonstrated that such development will not result in significant environmental effects (RDP-08).

The Plan recognises the importance that cutaway bogs have in relation to the provision of renewable energy within the county and that they could potentially accommodate large scale energy production in the form of wind farms and bio energy fuel sources (Section 2.3.2).

Section 3.5 of the Plan acknowledges that site suitability is an important factor in determining the suitability of wind farms, having regard to possible adverse impacts associated with for example residential amenities, landscape, views /prospects, wildlife, habitats designated sites, protected structures or bird migration paths and compatibility with adjoining land uses. It states:

'The characteristics of cutaway bog appear to be particularly suitable for wind development. The individual sites on cutaway bogs are large and generally uninterrupted by hedgerows, streams, or other natural features. Many are already connected to each other via corridors i.e. bog railway lines, which will allow for transmission infrastructure and roadways to be built between sites, avoiding impacts on the public road in terms of traffic and visual impact.

The areas where peatlands occur have a low-density road network and are traditionally sparsely populated, and while they have not completed avoided sporadic urban-generated one-off housing, they are the least densely populated areas of the county.

Appropriate buffers should be provided, which shall be a minimum of 2km from Town and Village Cores, European designated sites, including Special Areas of Conservation (SAC), Special Protection Areas (SPA0 and national designations, Natural Heritage Areas (NHA). The EIA associated with any development should also assess the flight paths of any Annex 1 bird species in order to minimise the potential for bird strikes.

A Wind Energy Strategy (WES) has been adopted as part of the Plan. It identifies areas within the county which are suitable/unsuitable for wind farm development. The strategy identifies six main areas within the county which are considered suitable for wind farm development (Table 1 and Fig 9).

Part of the development site is located within Area 7: Area South of Cloghan, which is stated to be suitable for large-scale wind farm development:

"7. Area South of Cloghans: Having regard to low levels of adjacent dwellings, reasonable access to the grid, proximity to access and areas of cut-over bog this area is suitable for windfarms.

The WES states that the areas identified are likely to be suitable for all scales of wind energy on account of a combination of factors that include;

- Available access to suitable grid connections (with 10km)
- The absence of compelling environmental constraints
- Low densities of adjacent residential development

The plan contains objectives/policies that support and encourage the development of renewable energy sources (EP-01, EP-02). Other relevant objectives/policies include:

Objective EO-01 *– It is an objective of the Council to achieve a reasonable balance between responding to government policy on renewable energy and in enabling the wind energy resources of the county to be harnessed in an environmentally sustainable manner. This will be implemented having regard to the Council's Wind Energy Strategy as follows:*

1. *In areas open for consideration for Wind Energy Development, as identified on Map 3.2, the development of wind farms and smaller wind energy development shall be open for consideration.*

2. *In all other areas Wind Energy Developments shall not normally be permitted -except as provided for under exemption provisions and as specifically described in Section 5.4 of the Wind Energy Strategy and Policy EP-05.*

***Objective EP-03** – It is Council policy to encourage the development of wind energy in suitable locations, on cutaway bogs within the wind energy development areas open for consideration identified in Map 3.2, in an environmentally sustainable manner and in accordance with Government policy, having particular regard to the Wind Energy Strategy for the county and Section 3.5.1, which states that appropriate buffers should be provided, which shall be a minimum of 2km from Town and Village Cores, European designated sites, including Special Areas of Conservation (SAC) and Special Protection Areas (SPA), and national designations, Natural Heritage Areas (NHA). Wind energy developments on cutaway bogs shall generally be developed from the centre out.*

***EP-04** – Cumulative effects of wind farm development can arise as the combined consequences of proposals for more than one wind energy development within an area or proposal(s) for new wind energy development(s) in an area with one or more existing or permitted developments. Offaly County Council will monitor cumulative impact assessments of wind energy proposals over the lifetime of the plan and cumulative impacts will be a material consideration in the assessment of any planning application for wind energy development.*

***EP-05** – It is Council policy that applications for wind energy development outside of the wind energy development areas open for consideration identified in Map 3.2 will not normally be permitted except when it can be demonstrated that the proposal falls into the following category:*

Category A: Single turbines that are sited close to and specifically relate to the operations of an industrial/commercial premises or a school, hospital or other community-related premises. Supporting evidence must be provided detailing that the development will only facilitate and is only related to the operation of the business or community facility.

Each proposal within this category will be open for consideration outside of the wind energy development areas and subject to site specific assessment in accordance with relevant guidance.

Policy EP-09 – It is Council policy to require any applicant for energy generation facility to provide details of all transmission infrastructure associated with the development and to assess the impact of this infrastructure on both the environment and landscape as a material consideration of the planning decision.

Guidelines/Reference documents

Wind Energy Development Guidelines for Planning Authorities 2006

The Wind Energy Development Guidelines for Planning Authorities 2006 constitutes Section 28 statutory guidance for wind energy development, including on provisions of the development plan and, in development management in the consideration of design, siting, spatial extent and scale, layout and height of turbines and cumulative effect having regard to its location within one of the six landscape character types and their identified sensitivities. Guidance is also provided on matters such as noise, shadow flicker, natural heritage, archaeology, architectural heritage, ground conditions, aircraft safety, wind take and cumulative effects.

Appendix 4 provides further details in relation to Best Practice for Wind Energy Developments in Peatlands.

Draft Revised Wind Energy Development Guidelines 2019

The Draft Revised Wind Energy Development Guidelines 2019 were published by the Department of Housing, Planning and Local Government in December 2019. The Guidelines recognise that the proper planning and sustainable development of areas and regions must be taken into account when planning applications are being assessed, irrespective of the significant role renewable energy has to play in tacking climate change.

The Guidelines note that potential impacts of wind energy development proposals on the landscape including the natural and built environment, must be considered along with legitimate concerns of local communities. The Draft focuses on a number of key aspects, including:

- Acceptable noise thresholds and monitoring frameworks;
- Visual amenity set back and spacing;
- Control of shadow flicker;

- Public consultation and obligatory Community Report, and
- Consideration of the siting, route and design of the proposed grid connection as part of the whole project.

Key aspects include:

- Sound/noise - consistent with WHO standards, proposing a relative rated noise limit of 5 dB(A) above existing background noise within the range of 35 to 43 dB(A), or 43 dB(A) being the maximum noise limit permitted day or night, applicable to outdoor locations at any residential or noise sensitive properties, and taking account of tonal noise, low frequency noise and amplitude modulation and the introduction of noise monitoring regime.
- Visual amenity setback – 4 times tip-height setback from the nearest point of the curtilage of any residential property (500 minimum mandatory setback)
- Shadow flicker – shadow flicker prediction modelling study to accompany applications. The adoption of technology that will shut off each turbine automatically to eliminate shadow flicker.
- Public consultation obligations and community report.
- Community dividend – measures to ensure enduring economic benefit to the community, and
- Grid connections – underground to be the standard approach.

Appendix 4 contains Best Practice for Wind Energy Development in Peatlands

<u>The Code of Practice for Wind Energy Development in Ireland on Guidelines for Community Engagement</u>

In December 2016, the Department of Communications, Climate Action and Environment, issues a Code of Practice for Wind Energy Development in Ireland on Guidelines for Community Engagement. The Code cites ten key areas for delivery on the part of wind energy developers and includes measures relating to the various project phases and a guide regarding annual reporting.

8.0 Planning Assessment

In order to comply with the requirements of the Planning and Development Act, 2000 (as amended), the assessment is divided into three parts to include planning assessment, environmental impact assessment and appropriate assessment.

Planning Assessment

There are issues which are common to both the planning assessment and the environmental impact assessment and to avoid repetition these are considered in the environmental impact assessment section of the report.

I have examined the file, considered relevant policy and guidance and I have inspected the site and environs. I have assessed the proposed development and considered the various submissions/observations received. I consider that the key issues that arise for consideration by the Board under this section of the report relate to the following:

1. Principle of the development
2. Compliance with Wind Energy Strategy of the Development Plan
3. Legal Matters
4. Ownership issues
5. Residential amenity
6. Other matters

8.1. Principle of the development

In terms of tackling climate change, reducing dependency on fossil fuels in energy production and achieving reduced greenhouse gas emissions, there is clear policy support at international, national and local level for renewable energy development, as documented in the EIAR and earlier sections of this report.

Whilst significant progress has been made, Ireland did not meet its 2020 renewable energy targets. The overall share of renewables stood at 12% which was below the

country's EU binding target of 16%. The share of renewable electricity (RES-E) was c 36.5 % and Ireland has a national target of 40%.[1]

Ireland is also set to fall short of its carbon emission reduction targets for 2030 (EPA, June 2019). The country, therefore, faces significant challenges in meeting the stringent targets set by the Government including a renewable electricity target of 70% by 2030 and more ambitious targets for greenhouse gas emission reductions.

Government policies identify the development of renewable energy as a primary contributor in implementing Ireland's climate change strategy and national energy policy. The crucial role of wind energy in electricity production is recognised at national level in the various plans and strategies published by Government including the 'National Renewable Energy Action Plan', 'Irelands Transition to a Low Carbon Future', 'Strategy for Renewable Energy 2012-2020, 'Climate Action Plan' and the 'National Planning Framework'.

It is acknowledged that wind energy has been the largest driver of growth in renewable electricity in the country and will continue to be the main contributor going forward. Significant increases in installed capacity will be required to meet mandatory targets. The proposed wind farm, with a projected output of 88.2MW, will deliver an additional renewable energy source. It will drive continued progress towards a low carbon economy, reduce dependence on fossil fuels, and the decarbonisation of the electricity sector, in line with European/national climate change strategies and energy policies.

At a local level, an increase in the amount of renewable energy is supported both a regional and county level through the Eastern and Midlands Spatial and Economic Strategy and the Offaly County Development Plan. Both emphasise the importance of energy to economic activity, the necessity to reduce dependence on fossil fuels in energy production and to increase the quantity of energy from renewables, including wind. The proposal is therefore consistent with regional and local policy.

The proposal also accords with the provisions of the National Peatlands Strategy in terms of the provision of large-scale windfarms on cutaway bog developed in conjunction with recreational and natural amenity.

[1] SEAI Energy in Ireland 2020 Report

I would point out to the Board that most of the observers have raised no issue with the principle of the development and are supportive of renewable energy, acknowledging that the delivery of wind energy developments, at appropriate locations, is crucial to Irelands efforts to reduce the effects of climate change. The proposal supports the migration from non-renewable to renewable energy, decarbonisation of the electricity sector a reduction in greenhouse gases and will be of economic benefit to the State, contrary to the views expressed by one observer.

I consider that the proposed development is acceptable in principle in this location.

8.2. **Compliance with Wind Energy Strategy of the Development Plan**

In terms of location, the site comprises a cutover bog and part of the country's peatlands which are identified both at national level and in the development plan as potential locations for large scale energy developments, including wind farms. A portion of the site is located within the area (Area 7) designated appropriate for wind turbines in the Wind Energy Strategy (WES) adopted as part of the Offaly County Development Plan. The designated area is shown in Figure 2.5 of the EIAR. Outside these areas, in accordance with the provisions of the plan, wind energy development will not normally be considered, with the exception of single turbines associated with an industrial/commercial premises or a school, hospital or other community related premises.

The planning authority state that as 7 no. of the proposed turbines (T3,T5,T8, T13,T14,T15 and T16 are outside the designated area, these should be omitted from the proposed development as they constitute a material contravention of the development plan. It is the applicant's contention that the area outside the designated areas bears similar characteristics to the designated area and meets the criteria for land suitable for wind energy development as outlined in the WES.

The identification of suitable areas for wind energy development in the WES emerged following a 'sieve mapping' analysis of the key ecological, landscape and other technical constraints, as well as proximity to settlements. It is the applicant's view that the range of focused and detailed environmental reports and assessments as part of the EIAR provide a more detailed analysis and understanding of the site.

While parts of the site are identified in the WES as suitable for wind energy development, it has emerged from the studies and assessments carried out as part

of the EIAR that it would be inappropriate to locate wind turbines in a number of areas, due to their ecological importance and to ensure that biodiversity is maintained. In this context, the EIAR notes that the north-eastern zone of the EIA study area (hatched orange on Fig 2.6) has been identified as the most biodiverse location in the vicinity. While it would be consistent with the provisions of the WES to locate turbines in this designated area, due to the finer grain analysis conducted as part of the EIAR, turbines have been excluded from this part of the site to ensure environmental impacts are minimised and sensitive receptors are protected. The same studies have indicated that there are areas outside the WES designated area that can accommodate turbines while minimising environmental impacts and ensuring that sensitive receptors identified in the WES remain unaffected.

The applicant states that the sensitive receptors identified in the WES and which informed the boundaries of the wind development area were fully considered prior to the decision to locate turbines in undesignated areas. For example, the area to the south of the development site lies outside the designated area in the WES as it lies within a 2km buffer of Lough Coura pNHA, which is designated for the occurrence of Fen habitat. However, the studies carried out as part of the EIAR indicate that Lough Coura lies upstream of the development site and no water or run-off will flow in the direction of the pNHA.

Similarly, the area to the north west of the site was excluded as it lies within a 2km buffer of another pNHA which relates to a private domestic dwelling designated for bats. The house lies 700m from the proposed windfarm and as noted in the biodiversity section of the EIAR, no impacts on bats are predicted as a result of the proposed development.

The boundaries of the wind development area are also influenced by a 2km separation distance to Natura sites. The NIS, which forms part of the application and which is considered in more details below under Appropriate Assessment, indicates that there will be no significant effects on any European sites arising from the proposed development. No impacts on Natura sites located within 2km of the areas designated for wind energy are predicted from the proposed development.

From my inspection of the site and its environs and the documentation provided by the applicant, I accept that the applicant has provided reasonable justification for the

location of turbines in particular areas of the site. I accept that the studies and assessment conducted as part of the EIAR provide a more detailed analysis of the site and notwithstanding the provisions of the WES, the applicant has provided a reasonable justification why certain areas of the site (designated in the WES) are inappropriate for wind energy development and that there are other areas (south and north west) which can accommodate turbines without impacting on ecological, landscape and other sensitivities in the area. Furthermore, I accept the applicant's argument that there is a level of contradiction in the Plan/WES, which on the one hand recognises the suitability of the cutaway bog on Bord Na Mona lands in this location (Area 7) for wind energy development and on the other hand the identification of parts of the bog landscape as unsuitable to accommodate turbines, particularly in areas which display similar characteristics.

I would also note that the entire area of the development site satisfies the other suitability criteria of the WES in terms of access to grid connections, lack of significant environmental constrains and low residential density in the vicinity.

I would also point out for the Board's information that the draft CDP and associated draft WES has been published by Offaly Co Council. Under its provisions parts of the site which are designated suitable for wind energy in the current WES have been removed (area to the north east including T17, T18, T19 & T20) and the proposed turbines T3,T5,T8,T13,T14 and T16, the removal of which is requested by the planning authority, would be contained within the area designated for wind energy.

The development as currently proposed includes turbines which are located outside the area 'open for consideration' in the current WES (T3,T5,T8,T13, T14, T15 and T16) and are therefore non-compliant with the provisions of the development plan. Should the Board be minded to grant permission for the development, it is not constrained by material contravention considerations. The Board determined (ABP-303157-18) that the development constitutes strategic infrastructure development and the application was made directly to the Board under Section 37E of the Planning and Development Act 2000, as amended. In making a decision in respect of a proposed development made under this section, in accordance with the provisions of Section 37G(2)

(6) The Board may decide to decide to grant permission for a development, or any part of a development, under this section even if the proposed development, or part thereof, contravenes materially the development plan relating to the area in which it is proposed to situate the development.

8.3. **Legal Matters**

I draw the attention of the Board to the submission made by Mr John Dooley following the receipt of further information. He refers to a recent decision from the European Court of Justice (C24/19) relating to a wind farm in Belgium whether the planning authority used guidelines in the assessment of noise, which he states are similar to those used in Ireland. In the case local residents brought an action seeking the annulment of the development consent. In support of their action they submitted that the Order and Circular, based on which consent was granted, infringed Article 2(a) and Article 3(2)(a) of Directive 2001/42 on the assessment of the effects of certain plans and programmes on the environment. It is Mr Dooley's contention that the Wind Farm Development Guidelines, which contain various provisions regarding the installation and operation of wind turbines, including measures on shadow flicker, noise and safety, and which are relied upon in planning decisions constitute plans and programmes which should be subject to Strategic Environmental Assessment (SEA).

Under the requirements of the Directive 'plans and programmes' prepared or adopted by an authority (at national, regional or local level) are subject to SEA. Government published guidelines are not subject to SEA. Should the ECJ alter this position, this is a matter for Government to address and is clearly beyond the scope of the Board in the context of the current application.

8.4. **Impacts in amenities of property in the vicinity**

Many of the observers have concerns regarding the potential impacts that could arise from noise, shadow flicker and visual impacts which could impact on their residential amenity. These matters are considered in more detail under the Environmental Impact Assessment section of the report.

Regarding shadow flicker, the EIAR identifies 5 no. dwellings that may be impacted by shadow flicker in combination with existing/permitted development. Subject to the curtailment strategy set out in the EIAR, no residual impacts are predicted up to a

distance of 10 rotor diameters from the site. No significant adverse impacts are likely for properties in the vicinity.

With regard to noise, there is potential for exceedance of daytime/night-time limits at 6 no. properties and attenuation will be required under certain wind conditions to ensure that the cumulative turbine noise levels comply with best practice noise criteria all noise sensitive locations. Subject to mitigation no significant effects are likely to arise which would be detrimental to the amenity of property in the vicinity. The noise assessment is considered in more detail in Section 9,11 of this report.

The visual impact of the proposed development will vary with the greatest potential impacts experienced in close proximity to the site. While there are a considerable number of residential properties along the road network surrounding the site, many of the roadways benefit from screening resulting in only intermittent views of the turbines. Having regard to the separation distance to the proposed turbines and the screening effects provided by roadside vegetation, the visual impacts are considered to be acceptable.

One of the observers (Teresa Ryan-Feehan) has a landholding opposite the briquette factory. The house on the site is derelict (R198) but there are concerns regarding potential noise and shadow flicker impacts that might arise, which would prejudice its future renovation. The nearest turbine is T2 at a distance of 750m. The property was considered in the noise assessment and was not identified as a location where cumulative noise levels would arise. It was also considered in the shadow flicker assessment and not identified as one of the 5 no. properties where curtailment would be required to protect residential amenity.

8.5. Ownership issues

The ownership of part of the site is contested by Mark Devery. He claims that a parcel of land in the Drinagh area (identified on a map), which is unregistered is in the ownership of Mark Devery and John Devery. The applicant's rebuttal claims that all the lands within the application boundary are in their ownership.

It is clearly not within the scope of the Board to adjudicate on matters relating to title or land ownership, which are not planning matters. These are civil matters which are more appropriately dealt with through the Courts.

8.6. Other matters

Windtake: The potential for windtake and effect the operational efficiency of the permitted Cloghan windfarm adjoining the site has been raised in a number of the submissions. The proposed development complies with the wind energy guidelines in this regard and the turbine layout is designed to ensure the minimum separation distances required to mitigate turbulence and windtake effects.

Community gain – Some of the observers consider that residents living close to the site should be compensated for potential impacts on their amenity. The applicant proposes to replicate the type of community gain schemes it currently operates on other windfarms including Mountlucas and Bruckana. These consist of a fixed level of funding, based on the installed capacity of the farm, that is made available each calendar year for community led projects in the area. The fund will be available for the lifetime of the project. The Community Benefit Fund will also provide support to residents within a prescribed distance of the wind farm through the Near Neighbour Scheme, which will provide direct benefits to those living adjacent to the windfarm.

9.0 Environmental Impact Assessment

9.1. Statutory Provisions

The European Union Directive 2014/52/EU, amending Directive 2011/92/EU, on the assessment of the effects of certain public and private projects on the environment, requires Member States to ensure that a competent authority carries out an appraisal of the environmental impacts of certain types of projects, as listed in the Directive, prior to development consent being given for the project. The EIA Directive was transposed into Irish law under the Planning and Development Regulations 2001 to 2018. Part 1 of Schedule 5 of the 2001 Regulations, includes a list of projects for which mandatory EIA is required. Part 2 of Schedule 5 provides a list of projects where, if specified thresholds are exceeded, an EIA is also required.

The proposed development falls within the definition of a project under the EIA Directive as amended by Directive 2014/52 and falls within the scope of Class 3 (j) of Part 2 of the Fifth Schedule of the Planning and Development Regulations 2001, as amended:

Energy Industry

(j) 'Installations for the harnessing of wind power for energy production (wind farms) with more than 5 turbines or having a total output of greater than 5 megawatts' require EIA.

The proposed development with a total of 21 no. turbines with an estimated installed capacity of 88.2 megawatts exceeds these thresholds and is therefore subject to mandatory EIA.

Directive 2014/52/EU amending the 2011 EIA Directive was transposed into Irish legislation on September 1st, 2018 under the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018. The EIAR was submitted to the Board on February 20th, 2020 and is therefore assessed under the new Directive.

The EIAR submitted with the application consists of four volumes;

- Volume 1: Non-Technical Summary and Main Text
- Volume 2: Photomontage Booklet
- Volume 3a: Appendices (Appendix 2.1 to 7.3)
- Volume 3b: Appendices (Appendix 7.4 to 14.1)

9.2. Compliance with legislation

The impact of the proposed development is addressed under all relevant headings with respect to the environmental factors listed in Article 3(1) of the 2014 Directive, which include:

(a) population and human health

(b) biodiversity, with particular attention to the species and habitats protected under Directive 92/43EEC and Directive 2009/147/EC

(c) land, soil, water, air and climate

(d) material assets, cultural heritage and the landscape

(e) the interaction between the factors referred to in points (a) to (d).

The environmental factors listed in Article 3(1) of the Directive are discussed in Chapter 5 to Chapter 14. Chapter 1 & 2 include an introduction and sets out the

background to the proposed development. The alternatives considered by the applicant are discussed in Chapter 3 and a description of the development is provided in Chapter 4. Interactions are set out in Chapter 15.

Article 3(2) of the Directive requires the consideration of effects deriving from the vulnerability of the projects to risks of major accidents and/or disasters that are relevant to the project concerned. This is addressed in Chapter 5 (Population and Human Health). The potential for 'flooding' is considered in Chapter 9 (Hydrology and Hydrogeology) and a site-specific flood risk assessment and a peat stability assessment report have been prepared and are contained in appendices to the EIAR.

The EIAR complies with Article 5 of the Directive and Schedule 6 of the Planning and Development Regulations 2001, as amended. It provides a comprehensive description of the project comprising information on the site, design, size and other relevant features of the project (Chapter 4). It describes the likely significant effects of the project on the relevant environmental media (Chapters 5 -14) and it provides a description of the measures envisaged in order to avoid, prevent or reduce and, if possible offset likely significant effects on the environment.

The Directive requires that the description of likely significant effects should also include an assessment of cumulative impacts that may arise from the proposed development in combination with other plans or projects. Section 2.7 of the EIAR sets out the methodology for the cumulative assessment and details of other projects considered. Cumulative effects are also considered under the various environmental factors in the individual chapters of the EIAR.

The EIAR includes a Non-Technical Summary of the information referred to in Article 5 (a) to (d) and additional information specified in Annex IV. It provides an adequate description of the forecasting measures used to identify and assess the significant effects on the environment. The Non-Technical Summary is concise and comprehensive and is written in a language that can easily be understood by a lay member of the public.

In compliance with the provisions of Article 5(3), the EIAR tabulates the inputs and qualifications of the study team and contributors under Section 1.9. I am satisfied

that the EIAR has been prepared by competent experts to ensure its completeness and quality.

Details of the consultations entered into by the applicant as part of the application are set out in Table 2-2 in Chapter 2. Consultation with the public included Community Information Sessions organised locally and advertised in advance in newspapers and local media, briefing sessions for local public representatives and the appointment of a Community Liaison Officer who conducted 'one to one' house visits to provide information on the project. I am satisfied that the participation of the public has been effective, and the application has been accessible to the public by electronic and hard copy means with adequate times afforded for submissions in accordance with the requirements of Article 6 of the Directive.

I note that no technical difficulties were encountered in the preparation of the EIAR (Section 1.10). In terms of the content and scope of the EIAR, the information contained in the EIAR generally complies with article 94 of the Planning and Development Regulations 2001, as amended.

I am satisfied that the information provided in the EIAR is reasonable and sufficient to allow the Board to reach a reasoned conclusion on the significant effects of the project on the environment, taking into account current knowledge and methods of assessment.

9.3. Alternatives

Under the provisions of Article 5(1)(d) of the 2014 Directive it is a requirement that an EIAR contain:

"(d) a description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the project on the environment".

Chapter 3 of the EIAR addresses the matter of alternatives in terms of the 'do-nothing option' and alternative locations, layout/design, turbine numbers/model and alternative renewable energy technologies.

In a 'do-nothing' option the site would remain as it currently is and be managed under the requirements of the IPC licence. This alternative was rejected on the basis

that it would represent a lost opportunity to capture the positive environmental effects arising from the project including the opportunity to harness a significant part of Co. Offaly's renewable energy resource and to contribute to meeting Government and EU targets for the production and consumption of energy from renewables and the reduction in greenhouse gases. Other losses would include the opportunity to generate local employment and investment and the recreational opportunity associated with the proposed development.

With regard to alternative locations, the site was chosen at it is in Bord Na Mona's ownership. The EIAR states that the company owns c 80,000 hectares of land, primarily in the midlands and these lands have been identified as being suitable for this type of development[2]. Understandably, the assessment was confined to lands within the Bord Na Mona land holding and no other sites were considered.

The next step in the process involved the identification of sites within the overall landbank with the potential for wind energy development. A total of fifteen sites were identified which were then subject to site-specific assessments. Each site was assessed against a number of criteria (Table 3.3) which covered the broad range of issues which can arise in wind farm development, including grid access/capacity, wind resource, landscape capacity, proximity to houses, supporting infrastructure, flood plain analysis, communications infrastructure etc.

Similar to other sites identified within the landholding, the proposed site emerged as a site with low potential for environmental effects. The Derrinlough site emerged as the preferred option due to the close proximity of potential grid connections c 300m north of the site and resulting environmental and project viability benefits.

The EIAR also considers alternative turbine models and turbine numbers on the site. It is acknowledged in the EIAR that it would be possible to achieve the same energy output from the site using smaller turbines (e.g.2.5 MW), but this would involve the use of a greater number of turbines and a larger development footprint. There would be increased use of materials, excavation, removal of peat and a need for a larger amount of supporting infrastructure (roads etc), which could increase the potential for negative environmental impacts to occur on biodiversity, visual amenities, hydrology and traffic and transportation. The proposed number of turbines is considered to take

[2] Strategic Framework for the Future Use of Peatlands, Bord Na Mona 2011

account of all site constraints and distances to be maintained between roads, houses, while maximising the wind energy potential of the site.

The turbine model will be subject to a competitive tendering process and the maximum height of the turbines will not exceed 185m. For the purposes of the EIAR a range of turbines within this size envelope has been assessed in the EIAR.

The turbine layout and design is influenced largely by the constraints identified within the site and the buffers required to protect watercourses and other sensitive features. The constraints and buffers are identified In Fig 3.1 of the EIAR, which also identifies a viable area within which the development can be accommodated. An initial turbine layout was developed to take account of all identified constraints and detailed site investigations were conducted including habitat mapping, hydrological and geotechnical investigations. There have been numerous revisions and amendments to the layout and number of turbines proposed on the site, arising from comments/recommendations by relevant statutory/non-statutory organisations, local authorities and the local community.

It is stated in the EIAR that the final proposed turbine layout takes account of all the site constraints (ecology, ornithology, hydrology, peat depths etc) and design constraints (set back from houses and third-party lands, infrastructure, wind-take, shadow flicker, noise and the separation distance to be maintained between turbines etc on the site). The layout also takes account of all site investigations and baseline assessments that have been carried out during the EIAR process in addition to feedback from ongoing discussions with the local community. It is concluded in the EIAR that the final chosen turbine layout is the optimal layout given it has the least potential for environmental effects.

The EIAR also considers alternative road layout routes within the proposed development, noting that maximum use is made of existing tracks where possible to minimise potential environmental impacts. It also considers alternatives for the location of ancillary structures such as the construction compounds, electricity substation and grid connection, borrow pits and site entrances and turbine delivery routes. The location of the substation (Drinagh North) was influenced by available capacity on the adjacent 110kV line, ease of access from local roads, good ground conditions and limited environmental constraints.

In terms of turbine delivery routes, two options were considered, both using the M6 before turning onto the N52 and the by-pass route around Tullamore towards Blue Ball. The chosen option (Option No 2) uses the R357 due to the limited road upgrade required and its proven suitability for the recently constructed Meenwaun Wind Farm, which is located directly to the south west of the proposed development site.

In terms of alternative sources of renewable electricity, given the scale of the site, solar energy was considered. This was rejected as a significantly larger development footprint would be required to achieve the same energy output. It would also be considered to have a higher potential environmental effect such as on hydrology and hydrogeology, biodiversity (habitat loss) and traffic and transport (construction phase).

In terms of mitigation, it is stated that a key element of the project's evolution has been centred around the principle of mitigation by avoidance, where the most environmentally sensitive areas of the development site have been avoided.

I consider that the matter of examination of alternatives has been satisfactorily addressed in the EIAR. I consider that the level of detail is reasonable and commensurate with the project. While I accept that the location of the project is influenced by Bord Na Mona's ownership of the landholding, the process of site selection within the landholding followed a comprehensive and transparent process. It indicates how the proposed development evolved and how it was adjusted to take into consideration environmental effects. I am satisfied that the process is robust and that the requirements of the Directive are fully complied with.

9.4. Likely Significant Effects on the Environment

This section of the EIA identifies, describes and assesses the potential direct, indirect and cumulative effects of the project under each of the environmental factors referred to in Article 3(1) of the Directive. The assessment follows the headings used in the EIAR which are as follows:

- Population and Human Health
- Biodiversity
- Ornithology
- Land, Soils & Geology

- Hydrology and Hydrogeology
- Air & Climate
- Noise & Vibration
- Landscape and Visual
- Archaeology and Cultural Heritage
- Material Assets.
- Interaction of Effects

9.5. Population and Human Health

EIAR summary

Chapter 5 of the EIAR considers these environmental factors in the context of population, employment, economic activity, tourism, amenities, health and safety, electromagnetic interference, property values, shadow flicker and residential amenity. The potential impacts on population and human health arising from other environmental factors (air pollution, water contamination etc) are considered in other chapters of the EIAR.

Population

The site, which extends across a number of townlands, is located in a rural area with a low population density. The predominant land use surrounding the site is farmland. The closest urban areas are the town of Banagher which is located c 3.4 km to the west, Cloghans which lies c 2km to the north and Birr c 7km to the south. The majority of services including shops, community facilities, sports clubs and public transport facilities are located within these settlements. The nearest school is Lumcloon national School c 1.2km to the northeast of the site boundary. There are also schools in Cloghan and Banagher. The closest dwelling is approximately 762m from the nearest proposed turbine (T15).

The EIAR also provides details of employment by socio-economic group (Fig 5.3). It reviews various reports that highlight the significant job creation and investment potential associated with wind farm development. The proposed development would contribute to these employment and investment opportunities, bringing benefits to both the State and the local economy.

There are no key identified tourist attractions associated with the subject site. Local attractions include Clonmacnoise which lies c.15km to the north and the River Shannon, used by recreational craft is located 3km to the west. Birr has its own attractions which include the castle, gardens and science centre. In terms of amenities there are opportunities for walking and cycling in the wider environment including The Grand Canal Greenway, The Offaly Way and the Hymany Way, all of which are located within 10km of the site. The Offaly Way traverses the Lough Boora Discovery Park which is located c.6km to the east of the site. Cloghans Lake located c 500m from the north eastern boundary is a popular fly-fishing lake.

The EIAR reviews studies conducted in both Ireland and Scotland to establish tourist attitudes to wind farms (Scottish Tourism Survey 2016, Failte Ireland Surveys 2007 and 2012) and these suggest that wind farm development has not had a detrimental impact on the tourism sector and would not impact on future visits to an area. Reviews of surveys on the public perception to wind farms is generally positive with an increase in positive attitudes through time and proximity to windfarms.

With regard to property values, it is noted in the EIAR that there have been no empirical studies carried out in Ireland on the impacts of wind farms on property prices. However, the largest and most recent studies in the United States and Scotland, which are described in the EIAR, conclude that wind farms have not impacted property values in local areas.

Human Health

The impacts of the development on human health are discussed in the EIAR in the context of health impact studies, turbine safety, electromagnetic interference, and vulnerability of the project to natural disasters/major accidents.

The most common cited health effects are associated with turbine noise leading to physiological and mental health problems. The EIAR provides details of published information, including literature reviews, journal articles, and reports by the HSE and the WHO supporting the view that there is no evidence of any direct link between wind turbines and health effects. The publications are summarised in Section 5.5.1 of the EIAR.

The HSE[3] position paper on wind turbines and public health was published in February 2017 to address the rise in wind farm development and concerns regarding potential impacts on public health. It determined that current scientific evidence on adverse impacts of wind farms on health is weak or absent.

I would point out to the Board that the most recently published WHO Noise Guidelines 2018[4] recommends reducing noise levels produced by wind turbines below 45 dB Lden. While the WHO recognises the potential for increased risk of annoyance at levels below this level, it cannot determine whether this increased risk can impact health. Wind turbine noise above this level is associated with adverse health effects.

Turbine safety

The evidence suggests that turbines do not pose a threat to the health and safety of the general public. Both the Guidelines published by the DoEHLG in 2006 and the Draft Revised Guidelines (2019) recognise that there are no specific safety considerations regarding the operations of wind farms. There have been significant technological advancement in turbine design and blades are manufactured to prevent any increase in lightning strikes and to minimise build-up of ice, with the potential to cause injury.

Electromagnetic Interference

Significant research has been carried out and published opinions consistently finds that exposures to EMF does not present a health risk if the exposure remains below the recommended limits. Underground cables will transport the electricity generated by the turbines from the site to the on-site substation. The proposed cables will be operated so that they fully comply with the international guidelines for ELF-EMF set by the International Commission on Non-ionising Radiation Protection (ICNIRP).

[3] Position Paper on Wind Turbines and Public Health: HSE Public Health Medicine Environment and Health Group, February 217.
[4] Environmental Noise Guidelines for the European Region: WHO Regional Office for Europe, 2018.

Vulnerability of the project to risk of major accidents and/or natural disasters

The EIAR acknowledges that here is limited potential for significant natural disasters to occur at the proposed site. There are no significant sources of pollution on a wind farm site with the potential to cause environmental or health effects.

The potential natural disasters that could occur would be limited to flooding or fire. The risk of flooding is addressed in Chapter 9 of the EIAR. It is considered that the risk of fire occurring and causing the wind farm to have significant environmental effects is limited and therefore a significant effect on human health is also limited.

The site is not regulated or connected to, or, close to any site regulated under the Control of Major Accident Hazards Involving Dangerous Substances Regulations (SEVESO sites) and there are no potential effects from this source.

Shadow Flicker

The shadow flicker assessment contained in the EIAR is based on compliance with the 2006 guidance but it is stated that the development can be brought in line with the 2019 draft guidelines through the implementation of the mitigation measures.

Specialised computer software (WindFarm version 4.1.2.3) was used to predict the level of shadow flicker associated with the proposed windfarm. It is noted that for the purposes of the assessment, a turbine with a rotor diameter of 150m and a hub height of 110m was modelled in order to assess a worst-case scenario. While these dimensions have been used, the actual turbine to be installed on the site will be subject to a competitive tender process and could include turbines with a different rotor diameter and hub height configuration than considered as part of this assessment. Regardless of the make or model eventually selected it will have a maximum tip height of 185m and the potential shadow flicker impact will be no greater than predicted in the assessment.

The model results assume worst-case conditions including 100% sunshine during all daylight hours throughout the year; the absence of screening; the sun is behind the turbines; the blades are facing the property and the turbine blades are moving. Of the 82 No. buildings modelled it is predicted that 50 properties may experience daily shadow flicker and based on the 2006 guidelines, the daily threshold is exceeded at 34 properties. However, the annual threshold for shadow flicker, once the regional sunshine average factor has been considered, is not exceeded at any property.

The EIAR also considers cumulative shadow flicker and includes the constructed Meenwaun Wind Farm and the permitted farm at Cloghan (including proposed amendments to increase tip height to 169m). The results of the cumulative shadow flicker assessment indicates that there are 5 no. properties with the potential for cumulative effects (Property No. 22, 32 67, 114 and 149). With the exception of Property 32 and 114) the annual threshold for permitted cumulative shadow impact as per the 2006 guidelines will not be exceeded.

Standard type mitigation measures are proposed to control the level of daily shadow flicker (Section 9.3.3.3) including local screening measures in agreement with the property owner, or through wind turbine control measures which enable the turbines operating mode to be changed during certain conditions or times, or to turn the turbine off completely if required.

Subject to the curtailment strategy proposed for all turbines that cause an exceedance in the existing daily and annual shadow flicker limits at residential properties up to a distance of 10 rotor diameters from the proposed development, no residual impact from shadow flicker on human beings is predicted.

Likely significant impacts during construction and associated mitigation measures

During the construction phase there is potential for impacts from noise, dust and construction traffic to impact on the amenity and health of the local population. This phase of the development could also pose a potential health and safety hazard to construction workers. Standard health and safety measures and best practice measures to control noise and dust will be implemented to ensure potential impacts are minimised. A traffic management plan will be developed and implemented to ensure any disruption to local residents will be kept to a minimum. Provided these mitigation measures are fully implemented, residual impacts on population and human health are not anticipated. There will be positive effects on the local economy due to direct and indirect job creation associated with construction.

Likely significant impacts during operation and associated mitigation measures

The operation of the wind farm has the potential to result in health and safety issues, impacts on tourism, shadow flicker and interference with communication systems. visual impacts. Noise is considered in Chapter 11 of the EIAR.

Mitigation measures to reduce these impacts are set out in the EIAR. An operational phase Health and Safety Plan will be developed to address identified health and safety issues associated with the operation of the site. Long-term positive impacts on tourism are predicted due to the social and recreational benefits associated with the amenity walkways and paths. There will be positive impacts on the local economy associated with the proposed Community Gain Scheme and the Near Neighbour Scheme. Wind turbine control measures will be implemented to mitigate any identified shadow flicker limit exceedances.

With regard to interference with communication systems, it is accepted that wind turbines have the potential to interfere with broadcast signals by acting as a physical barrier or causing a degree of scattering to microwave signals. This has the potential to impact on the amenity of sensitive receptors. Appropriate buffer zones have been incorporated into the design of the windfarm to ensure no electromagnetic interference with signals and communications occur. Consultation with national and regional broadcasters and fixed/mobile phone operators indicated that there would be no interference risk from any of the proposed turbines provided the design complies with the recommended buffer zones.

Likely significant impacts during decommissioning phase

The EIAR states that impacts during the decommissioning phase will be similar, but of less magnitude than those during the construction phase.

Cumulative Impacts

The potential for cumulative impacts is considered in Section 5.9.5 of the EIAR in terms of shadow flicker and residential amenity. Table 5.8 identifies 5 no. dwellings may be impacted by shadow flicker in combination with existing/permitted wind farm developments within 1.5km of the development site. Monitoring and mitigation measures as set out will be implemented to ensure compliance with the thresholds set out in the 2006 Guidelines to ensure no residential property will be impacted.

Other chapters of the EIAR consider cumulative impacts on human beings arising from noise, visual impact and traffic.

EIAR conclusion

The overall conclusion reached in the EIAR is that subject to appropriate mitigation, the proposed development will not result in any significant direct, indirect or cumulative effects on population and human health.

Assessment

The main issues in the submissions raised relate to impacts on human health, shadow flicker, turbine safety and potential impacts on tourism in the area.

While there is no scientific evidence that the operation of the wind farm would result in negative health outcomes, it is recognised there is potential for increased annoyance associated with noise. Subject to compliance with the recommended noise levels for the protection of human health, which is discussed in more detail below (Section 9.11), the potential for significant effects on human health does not arise.

Many of the observers have raised concerns regarding potential shadow flicker exceedances at residential properties. Shadow flicker can cause annoyance and can impact on the amenity of residential properties or other sensitive receptors. The applicant has committed to a curtailment strategy for all turbines that cause an exceedance in the existing daily and annual flicker shadow flicker thresholds at a distance of up to 10 rotor diameters from the proposed development. These measures are standard best practice on windfarm sites and subject to the implementation of these measures, I am satisfied that shadow flicker will not result in an unacceptable negative impact on the buildings likely to be affected. It can therefore be concluded that subject to mitigation, no significant impact from shadow flicker will arise which would result in annoyance to local residents or impact on the amenity value of dwellings or other structures. I would point out to the Board that the planning authority considers that the use of the SCADA control system should be the preferred method to mitigate shadow flicker.

While concerns have been raised regarding potential impacts on property values arising from the proposed development, there is no evidence that adverse effects occur. Based on the international literature documented in the EIAR, I consider it is

reasonable to conclude that the provision of a wind farm on the site would not impact on the property values in the area.

I consider that the observers concern regarding turbine safety are unfounded. The EIAR refers to the improvements in turbine design which ensures that that the operation of the windfarm would not pose any threat to the health and safety of the general public.

Due to the separation distance to tourist attractions in the locality, no significant impacts are likely to arise. While there will be some visibility of the upper sections of the turbines from some local attractions including Lough Boora Discovery Park (Photomontage 5) these impacts have been fully assessed in the EIAR and in this report (Section 9.12) and are not considered to be significant. The matters raised by the observers relating to the development of tourism products in the wider area are outside the scope of the current application.

The planning authority raised issues regarding discrepancies in Table 5.7 of the EIAR, with regard to labelling of house no's/turbines and the hours of shadow flicker. This matter was adequately addressed in the response to further information.

Conclusion

I consider that the information provided in the planning application documents is sufficient to allow the impacts of the proposed development to be fully assessed. I am satisfied that the impacts identified on population and human health would be avoided, managed or mitigated by the measures forming part of the proposed scheme. I am, therefore, satisfied that the proposed development would not have any direct, indirect or cumulative significant effects on population and human health.

9.6. Biodiversity

EIAR summary

Biodiversity is addressed in Chapters 6 of the EIAR. This chapter is supported by Appendix 6.1 to Appendix 6.8 in Volume 3A of the EIAR.

Details of the existing environment was obtained from information provided by Bord na Mona and from a range of surveys, which including desk-top and field surveys. The desk top study included a review of online web mappers, recognised data bases and records to establish baseline conditions. The field surveys included multi-

disciplinary walkover surveys (7 days) covering the entire study area. These included habitat surveys and surveys designed to detect the presence/likely presence of protected species and invasive alien species. These surveys were then used to inform the scope of targeted ecological surveys, which included badger, otter and bats surveys, as well as Marsh Fritillary and invasive species surveys. A dedicated fisheries assessment was also undertaken for targeted species including salmon, trout and lamprey.

The habitats within the study area were mapped in detail by Bord na Mona in 2014 and ground truthed in 2018/19 as part of the assessment. The habitats are mapped and described in the EIAR and were evaluated in accordance with the criteria adopted by the NRA[5] which classifies sites in terms of their ecological importance (International, national, county (higher value), county (lower value) or local importance (lower value).

European sites within a 15km radius of the site are identified in Fig 6.2 and all designated sites are shown in Figure 6.3. All designated sites within the Likely Zone of Impact of the proposed development are listed in Table 6.3. A number of watercourses that drain the study area are hydrologically connected to 2 no. European sites, the River Shannon Callows SAC and Lough Derg North East Shore SAC. A full assessment of the impact of the development on these Natura 2000 sites is provided below under Appropriate Assessment (Section 10.0). Lough Coura pNHA is located adjacent to the site and is the only nationally designated site which is included within the Likely Zone of Impact.

Habitats

The surveys indicate that there are no Annex 1 habitats present on the site. No protected botanical species or invasive species listed on the Third Schedule of the European Communities (Bird and Natural Habitats) Regulations 2011, were recorded within the study area.

The vast majority of the site comprises cutover bog or cutaway peat. The EIAR provides a description of the secondary habitats that have begun to form on the cutover bog following cessation of peat extraction/milling (Fig 6.4, Fig 6.4(a) and Fig

[5] Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009)

4(b). The habitats that occur beneath the proposed development footprint are shown in Fig 6(c) and Fig 6(d).

The habitats identified of highest ecological significance are those associated with the small, fragmented areas of Raised Bog habitat. This habitat would have dominated the entire site prior to the commencement of the industrial peat cutting operations and have been assigned County significance as they contain the only remaining examples of Raised Bog habitat in the area. These areas are avoided by the development footprint. The secondary habitats that occur on the cutaway sections of the site vary in their ecological significance. The majority are of local importance ranging from 'low' to 'higher' value.

Areas of open water occur where peat extraction has ceased. The largest area of open water and reed swamp occurs to the east of the study area within the area known as the Drinagh wetlands. Another large wetland occurs within the south-eastern portion of the Clongawny peatland adjacent to the N62. Deep drainage channels run through the site, the majority of which are devoid of vegetation.

The site is drained by a number of watercourses that surround the study area. The Little River flows in a north-westerly direction through the centre of the site and drains into the River Shannon via the Brosna River. The Silver River flows along the eastern boundary and a number of small tributaries flow west/southwest before joining the Rapemills River which flows into the River Shannon to the west.

To facilitate the proposed development, it is proposed to modify an existing road junction at Kennedy's Cross. The modifications will occur in an area of improved grassland which is surrounded by a highly managed hawthorn dominated hedgerow. A wet woodland area to the south of the proposed junction modification will not be impacted by the works.

The proposed grid connection route, substation and associated infrastructure is located within an area dominated by cutover bog and associated secondary habitats, including birch/willow scrub and recolonising bare ground. The proposed amenity pathways will predominantly use the new internal site roads. The additional links to provide connectivity between the internal roads and the local/regional roads around the site will primarily use existing machinery passes.

Fauna

Dedicated faunal walkover surveys for badger, otter, bats and marsh fritillary were undertaken on the site during 2018/2019 (7 days).

Badger – A total of 4 main setts and 4 outlier setts were recorded within and adjacent to the study area. All were located outside the development footprint. One sett containing seven entrances occurs within c 35m of the proposed grid connection route and associated access track.

Otter – the sightings were predominantly of individuals which were recorded within the study area and downstream of the site (Fig 6.7). The main watercourses and large artificial drainage channels were assessed as providing suitable commuting and foraging habitat. Some of the larger waterbodies would also provide suitable habitat. However, the majority of drainage ditches within the study area are small and not suitable for otter, and the peat drainage ditches were assessed as having no/low suitability due to their small and highly modified channels of low fisheries value. No signs of otter were recorded during the dedicated fisheries assessment or kick sampling of watercourses surrounding the study area.

Bats – bat surveys included roost survey, manual transect surveys and ground-level static and at height surveys. One building was identified as a roost site and is being retained. No potential trees roosts were identified, and no evidence of bat use was recorded elsewhere during the roost assessment. During the manual transect surveys, bats were recorded during each survey. Bat activity was concentrated along the track beside the briquette factory where there is linear mature forestry. Significant bat activity was also recorded during the ground-level static surveys with different species dominant during different seasons. Results for each species can be found in Section 4.6 of the bat report (Appendix 6.2 of the EIAR).

Marsh Fritillary – dedicated surveys indicated suitable habitat in small areas throughout the study area (Fig 6.8), which was mainly associated with areas where stone material has been brought into the site for the construction of railway tracks, access roads etc to the east. There is little suitable habitat on the Drinagh side due to the wetter and scrubbier habitats. None of the colonies recorded within the site occur within the development footprint.

Aquatic fauna – a detailed aquatic survey was undertaken in 2019 (Appendix 6.3). The location of all survey sites is shown in Fig 2.1 of this appendix. Salmonid habitat

ranged from poor to moderate value across the majority of the sites surveyed, reflecting the peat-based nature and heavily silted substrata of many sites. Only the Silver River offered good salmoinid habitat. Unnamed wetlands at Clooneen and Stonestown were lacustrine habitats but provided some moderate nursery value for brown trout as did a settlement pond with outflow at Derrinlough.

Lamprey habitat was also poor across the majority of the sites surveyed, with the exception of the Silver River at Millbrook Bridge which offered moderate quality spawning and nursery habitat.

White-clawed crayfish were recorded from a single site on the Feeghroe Stream. Although there was moderate to good suitability for the species at other sites (Silver River, Little Cloghan River and settlement pond at Derrinlough), no live crayfish were recorded. Crayfish are known to occur in the Little Cloghan River and the connected settlement pond at Derrinlough, both in the vicinity of the Derrinlough briquette factory.

Other fauna -other fauna recorded during the site surveys included fox, hare, pine marten and Fallow deer. It is likely that other species such as Pygmy shrew, wood mouse, mink and stoat would occur on the site. Two squirrel dreys were recorded within a small area of willow carr woodland, to the east of the proposed junction modifications at Kennedy's cross. These will not be impacted by the proposed development.

Invertebrates - The EIAR lists both the terrestrial and aquatic invertebrates recorded during walkover surveys and kick samples of watercourses.

All of the fauna is assessed as of Local Importance (Higher value). This is on the basis that the habitats within and adjacent to the study area are likely to be utilised by a locally occurring population of badger and there is no evidence of populations of otters being significant. With regard to bats the habitats surrounding the development are likely to be used by bat populations of local importance and no roost sites have been identified within/adjacent to the development footprint. Due to the distribution of suitable habitat within the study area as well as the widespread distribution of the species within the western part of the site, Marsh fritillary is also assed as Local Importance (Higher Value).

The aquatic fauna within the study area is assigned Local Importance (Lower Value) due to the highly modified and silty aquatic habitats that are present. The downstream watercourses and fauna within them is assigned Local Importance (Higher Value) due the known populations of salmon, trout and lamprey species as well as otter.

Table 6.13 of the EIAR lists all ecological receptors and assigns them an ecological importance as per the NRA Guidelines, 2009. It also identifies the Key Ecological Receptors (KER's) for the purpose of the assessment.

Likely significant effects during construction stage and associated mitigation measures

Habitats

The proposed development will result in the loss of habitat on the site (Table 6.14). The habitats are of Local Importance (Lower Value) and are not identified as key ecological receptors. The loss of habitat involves mainly the loss of bare peat that was in active production until recently and is of very low ecological value. Any direct and indirect impacts on these habitats are not assessed as significant.

There will be impacts on habitats that are identified as key ecological receptors including rivers and streams, open waterbodies, bog woodland and pioneering scrub, natural woodland, poor fen and heath type communities.

The footprint of the development has been designed to avoid the large waterbodies and watercourses within the study area. The internal road network only crosses one large watercourse and will utilise an existing bridge with no instream works proposed. The proposed amenity trail to the east of the site will cross the Island River using the existing railway track and associated crossing. There is, therefore, no potential for direct impacts on these habitats.

The proposed development result in the loss of cutover bog, which is developing as pioneer fen, heath type habitats, bog woodland and scrub. This is a permanent and irreversible but will only affect a small area of this habitat which is widespread across the site. There will be no impacts on uncut raised bog and natural oak/ash/hazel woodland habitats that are entirely avoided by the proposed development. There is potential for indirect effects on the habitats immediately adjoining the footprint through drainage.

Mitigation is achieved in the first instance by avoidance. The development has been designed to avoid the most sensitive area of uncut raised bog and natural woodlands. The proposal also provides for the replacement of bog woodland and scrub habitat that will be lost in other parts of the site to ensure that there will be no net loss ofthese habitats. It also provides for the ecological enhancement of areas of cutover bog through rewetting to promote the development of wetland vegetation. All of the measures are set out in the Biodiversity Management Plan (Appendix 6.7 of EIAR)

Construction activity has the potential to result in indirect impacts on aquatic receptors due to the run-off of silt, nutrients and other pollutants into these watercourses. The proposed development will cross small drainage ditches which are not themselves ecologically sensitive but provide connectivity to the larger watercourses that surround the site. Therefore, the potential exists for significant indirect effects on habitats and species in the form of pollution during the construction stage.

Details of how water quality will be protected during construction is set out in a detailed drainage maintenance plan (Section 4.7 of the EIAR) and specific mitigation in relation to water quality is provided in Chapter 9 (Hydrology & Hydrogeology). The Construction and Environmental Management Plan (CEMP) provides details of how the measures will be implemented during construction.

Following the implementation of the mitigation measures there will be no significant residual effects on habitats within the site. The implementation of the Biodiversity Management Plan will result in an overall long-term positive impact on the habitats within the study areas a result of the enhancement measures.

As the proposal will not result in any significant negative effect on the cutover bog habitats on the site, it is concluded in the EIAR that it cannot contribute to any cumulative effect in this regard.

Fauna

The proposed development has the potential for habitat loss and disturbance impacts on fauna recorded within the site. The EIAR assesses the potential impact on species which have been identified as key ecological receptors including otter, badger, marsh fritillary and bats.

There is no potential for direct impacts on otter as the development is designed to avoid watercourses and wetland habitats. All major infrastructure (turbine bases, substation, construction compounds) will be located over 50m from watercourses and wetland habitat and no instream works are proposed. There is no potential therefore for the direct loss or fragmentation of otter habitat.

There is potential for indirect effects in the form of disturbance to otter and as a result of habitat deterioration arising from water pollution. As noted, a detailed drainage maintenance plan will be implemented to ensure that water quality will be protected during the construction of the development. The details of how these measures will be implemented are set out in the CEMP. Following the implementation of these measures no significant residual impacts on otter are predicted.

There is no potential for significant loss of badger habitat as a result of the proposed development, which has been designed to avoid all identified badger setts. The proposed internal underground cable route and site access track will run close to a sett, which in the absence of mitigation has the potential to result in disturbance/displacement or even mortality of the badgers that occupy it.

There may be small scale loss of foraging habitat to facilitate the construction footprint. While this is irreversible, it is considered to be insignificant in the context of the extensive areas of suitable habitat available within the study area, and the proposed development will not result in any barriers to movement for badger.

To mitigate potential impacts on the badger sett close to the internal cable route and site access track, a badger sett disturbance licence will be obtained from the National Parks and Wildlife Service. An exclusion zone of 30m will be maintained around the sett for the duration of the works and all works within 50m of the sett will be undertaken outside the badger breeding season. In accordance with best practice, the mitigation measures will be undertaken/supervised by an appropriately qualified ecologist. The access route will be a ‘floating road’ construction which will minimise the requirement for excavation and reduce the construction time and intensity of the construction works in this area. Subject to the implementation of these mitigation measures the potential for significant residual impacts on badger does not arise.

The proposed development avoids all recorded marsh fritillary colonies and identified suitable habitat within the study area. However, some of the works will occur close to suitable habitat with the potential in the absence of mitigation to result in loss of habitat/disturbance of the species.

Best practice measures for the protection and enhancement of the supporting habitat have been prepared in consultation with Butterfly Conservation Ireland and are described in the Lepidoptera Management Plan contained in Appendix 6.6 of the EIAR. In the first instance the measures include avoidance of supporting habitat for the species. Pre-construction measures include fencing off areas of suitable habitat prior to the commencement of the works under the guidance and supervision of a suitably qualified Ecological Clerk of Works (ECoW). Pre-construction surveys, and other measures including pollinator enhancement measures, habitat condition monitoring etc will be undertaken to mitigate potential impacts during construction.

Following the implementation of these best practice measures there is the potential to increase the extent and quality of available habitat on the site for marsh fritillary. This will result in positive residual impacts for the species.

It has been established that the site is used for foraging and commuting bats. Given the overall size of the site, it is not considered that the proposed development will result in a significant loss of available habitat for bats species. No roost or potential roost features were recorded in close proximity to the proposed development. No buildings or other structures with the potential to support bat roosts will be demolished to facilitate the development. The trees occurring with the development footprint were assessed as not providing suitable cavities to support any significant roosts. The overall conclusion reached in the EIAR is that there will be no potential for significant effects on the local bat population and that habitat loss/disturbance are only likely to result in imperceptible effects.

The proposal involves the felling of linear section of birch dominated woodland within the site to facilitate site access roads. This will result in the creation of more woodland edge habitat which is considered will benefit feeding and commuting bat species locally. Any loss of woodland will be mitigated through replacement planting. In addition, best construction practice will be implemented to minimise general noise and disturbance.

No significant residual impacts on bats are envisaged which would result in significant effects on the local population. There will be no net loss of woodland and an increase in woodland edge vegetation.

Likely significant effects during operation stage and associated mitigation measures

Habitats

Following the completion of the proposed development there will be no additional land take or loss associated with the revegetated peatland habitats and as such there is no potential for any significant effects in this regard. The proposed development has the potential to result in enhancement of the surrounding areas through habitat rehabilitation management that will be undertaken throughout the operational phase of the development. Details of the management that will be undertaken are set out in the Biodiversity Management Plan (Appendix 6.7).

The increased amount of hardstanding associated with the windfarm has the potential for accelerated run-off from the site to the surrounding watercourses and open water bodies. This may cause erosion, which could cause a deterioration of surface water and supporting habitat quality. There is also the potential for pollution run-off that may be associated with any vehicle usage of the site. In the absence of mitigation there is potential for negative effects.

All major infrastructure associated with the proposed development will be located over 50m from any significant watercourse. Potential impacts on water quality are therefore mitigated by design and the best practice measures set out in the Hydrology and Hydrogeology section of the EIAR. Following the implementation of the mitigation measures, the potential for significant residual impacts does not arise.

Fauna

Positive impacts on land based mammals including badger and otter are anticipated during the operational stage of the development. As noted, the proposal is to implement a Biodiversity Management Plan which will result in the establishment of habitats of higher value on the site through the replacement of any woodland and scrub habitat lost during construction and through the regeneration of areas of bare peat through rewetting.

With regard to marsh fritillary, the implementation of the Lepidoptera Management Plan, which describes the measures required during the construction stage that will create a suitable substrate for the natural colonisation of devil's-bit scabious (food source for caterpillar), will allow for an increase in suitable habitat for the species.

There is moderate to high median level of bat activity on the site with peak levels of activity for Common and soprano pipistrelle, and Leisler's bat. These are identified as species that are at a high risk of collision with operating turbines. Other species recorded such as *Myotis* species and brown long eared bats present a lower were collision risk. There is, therefore, potential for the operating windfarm to result in significant effects on the local bat population.

To mitigate these impacts, it is proposed to reduce the value of habitats for bats in the areas surrounding the turbines by creating a buffer of at least 50m between the tip of the blade and any tree or tall vegetation that could provide high quality foraging habitat for bat species. On-going monitoring of bat activity will be undertaken for at least three years post construction, which will provide information on the actual recorded impact of the wind turbines on bat populations. If significant effects are recorded, a range of measures are proposed to ensure that such effects are fully mitigated. These include blade feathering, curtailment of turbines during certain conditions and increase of buffers surrounding the turbines. It is concluded in the EIAR that following the implementation of these measures, there is no potential for significant residual effects or cumulative impacts.

No significant habitat for salmonid, lamprey, white-clawed crayfish etc were recorded within the footprint of the proposed development. All major infrastructure will be located at least 50m from the watercourses and wetlands on the site. The potential for impacts on aquatic faunal species is through indirect effects on their habitat resulting from pollution which is capable of effective mitigation, as set out above.

Likely significant effects during decommissioning stage/mitigation measures

There will be no additional habitat loss associated with the decommissioning stage of the development. The removal of the infrastructure will involve similar operations to construction but without earth moving or excavations as the turbine bases etc would remain in place. The works would, therefore, be of a smaller scale but would have

similar effects on ecology as those during construction. There would be no additional or ancillary impacts associated with the decommissioning stage.

Similar mitigation measures to prevent significant impacts on water quality and associated aquatic fauna, terrestrial fauna and marsh fritillary would be implemented. Details of the mitigation and best practice that will be employed to avoid any potential for significant residual effects during decommissioning of the proposed wind farm are detailed in the CEMP.

Cumulative Impacts

The proposed development will not result in a significant loss of cutover peatland and woodland within the overall site. The proposal includes mitigation in the form of habitat management and rehabilitation that will protect a greater area than will be lost. This is described in the Biodiversity Management Plan (Appendix 6.7). There is, therefore, no potential for the proposed development to act in combination with other plans or projects to result in significant cumulative habitat loss.

The watercourses on the site were assessed to be of low ecological significance, with the watercourses becoming more ecologically sensitive downstream. The proposal includes a range of measures to prevent any pollution or hydrological effects outside the development footprint. The implementation of these measures ensures that there is no potential for significant cumulative effects on any downstream receptors, whether the proposed development is considered on its own or in combination with other plans or projects.

No significant effects in relation to the disturbance, displacement or mortality of faunal species have been identified. There is therefore no potential for the development to contribute to cumulative effects. The proposed development will not result in any significant residual effects on biodiversity and will not contribute to any cumulative effect when considered in combination with other plans and projects.

EIAR conclusion

It is concluded in the EIAR that subject to mitigation, the proposed development will not result in any significant residual effects on biodiversity and will not contribute to any cumulative effects when considered in combination with other plans and projects.

Assessment

The observers refer to the sensitivity of the area for wildlife, flora and fauna and question what plans are in place for habitats. The Department of Culture, Heritage and the Gaeltacht (DoCHG) raised the following issues:

- the manner in which the 'do nothing' scenario was considered in the EIAR.
- Draft Rehabilitation Plan
- carbon balance on the site.
- potential cumulative impacts of the existing/proposed drainage network on water dependent receptors.
- Biodiversity Management Plan
- Lepidoptera Management Plan.
- Impacts of aviation and other lighting on biodiversity.

The applicant's response to further information addresses these matters.

Do-Nothing scenario

The DoCHG refers to the requirement for an assessment of the evolution of the baseline environmental conditions rather than a static description of the state of the environment at the time of the assessment.

Annex IV (3) of the amending EIAR Directive requires the following:

'A description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the project as far as natural changes from the baseline can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge'.

The Guidelines on the Information to be contained in Environmental Impact Assessment Reports (Draft Report EPA,2017) states:

'The environment will change over time, even without the introduction of the proposed project. Therefore, the EIAR must include a description of the likely evolution of the environmental factor in the absence of the project. This predicted changing baseline may be referred to as the likely future receiving environment'.

Section EIAR at Section 3.3.1 considers the 'Do-Nothing' option, which would be to leave the site as it currently exists with no changes to existing land use practices. In this scenario the site would continue to be managed in accordance with the IPC Licence. In terms of addressing the issues raised by the DoCHG, I note that Appendix 6.8 of the EIAR includes 2017 Draft Rehabilitation Plans for Drinagh and Clongawny Bogs, which describe the existing conditions on the bogs and provide a broad outline of how the habitats would evolve naturally over time and recolonise with vegetation, in the absence of the proposed windfarm.

Draft Rehabilitation Plans

The DoCHG questioned what rehabilitation measures would have been undertaken in the absence of the windfarm development and whether these plans have been undermined by the proposed development. The applicant's response to further information provides clarity on this matter. Draft Rehabilitation Plans dated 2017, which are the most recent plan for rehabilitation in the absence of the windfarm, are included as Appendix 5 of the response. The more recent plans include the wind farm development and are dated 2020.

The main difference between the two sets of plans is that in 2017 there was still some active peat production on both Drinagh and Clongawny Bogs. Commercial peat extraction has now ceased. The 2017 Draft Rehabilitation Plan commits to stabilise the site and prevent risk to the environment following cessation of operations. The 2020 Draft Rehabilitation Plan includes more enhanced measures including rewetting, measures to provide optimum conditions for peat formation, measures for water treatment, maintenance of remnant Raised Bog Habitats, management of woodland and amenity provisions. It is predicted that 44% of the site will be rehabilitated to support wetland habitats, which would significantly offset any potential loss of cutover and revegetating peatland as a result of the proposed windfarm.

While it is recognised that the proposed windfarm has the potential to have a significant impact on the overall cutaway environment, the proposed development will occupy a very small area (1.98%) of the total area of cutover and revegetating bog habitats within the overall site. The windfarm has been designed to minimise the impacts on the wettest habitats within the site and those with most potential to rewet

in the future. I also note that the drainage plan has been designed to ensure that effects of the development are confined to a small zone of influence and will not impact significantly on surrounding areas.

The DoCHG also raise issue with the level of detail regarding the rehabilitation measures contained in the draft plans. The plans provide a description of the site and details of current environmental conditions (hydrology, topography, residual peat types/depths and subsoils) and outline the works that will be required to achieve successful rehabilitation. A timescale for implementation is provided (short, medium and long term) which includes pre/post construction phases of the wind farm and decommissioning.

The plan does not identify the areas where rewetting will occur or how this will be achieved. The response includes a potential habitats map (Appendix 6) which provides details of areas that are suitable for rewetting. The applicant states that the level of detail required to achieve the aims set out in the 2020 Draft Rehabilitation Plan, which would include exact locations of the drains to be blocked and bunds to be constructed (to contain water) etc, can only be determined once all current operations on the site have ceased. This would not appear unreasonable.

The response document elaborates on the detail of the rehabilitation measures, (drain blocking, cell bunding) which follow standard procedures regularly undertaken by Bord Na Mona and used/trialled in other windfarm rehabilitation programmes. In areas that cannot be rewetted, grassland and birch dominated scrub habitats will be established and measures will be employed to control water, accelerate vegetation establishment including fertiliser application, sphagnum inoculation, and inoculation of Reeds and other vegetation from donor sites.

I accept that the rehabilitation plans will be evolving and changing, responding to constantly altering conditions on the site. I accept that the current draft document provides only a broad outline of the measures that are intended to be implemented on the bogs. I accept that the rehabilitation of the bogs can progress in tandem with the proposed development.

Carbon balance of the site

The DoCHG states that there is no evidence to support the claims made in the EIAR that the integration of the windfarm into the rehabilitation plans for the bogs will not

have a significant impact on the carbon balance of the site in the 'Do-Nothing' scenario.

The applicant's response notes that the footprint of the proposed development is 34.2ha or 1.45% of the entire site. An assessment of the potential loss of carbon sequestration due to the proposed windfarm is provided in Table 2.2 of the response. Based on a number of conservative assumptions as detailed in the response, it is estimated that the loss of carbon sequestration will range between 2% and 14.2% in a worst-case scenario, which is not considered to be significant.

Cumulative impacts of existing and proposed drainage systems on water dependent receptors

It is contended by the DoCHG that the impact of the existing drainage system on water dependent ecological receptors should have been assessed. I would point out to the Board that the impacts of existing operations on water quality and on the watercourses downstream of the site were fully considered both in the EIAR (Chapter 9 -Hydrology and Hydrogeology) and in the NIS.

The cessation of peat operations would have beneficial effects on water quality. It is proposed to integrate the proposed drainage system associated with the windfarm with the existing drainage system on the site to existing bog outlets. It is predicted that there will be a slight increase in run-off (0.06%) in a worse-case scenario arising from the proposed development. Post mitigation a reduction in run-ff will occur due to additional attenuation storage and water treatment in silt traps.

Subject to mitigation measures proposed for each phase of the development, which are standard best practice to ensure the protection of the water environment from various pollutants including silt, cement, hydrocarbons etc, the potential does not arise for significant impacts on water dependent receptors due to a reduction in water quality arising from the proposed drainage system. There is, therefore, no potential for cumulative impacts to arise in combination with the existing bog drainage system.

Biodiversity Management Plan

The DoCHG states that contrary to the information contained in the EIAR, the Biodiversity Management Plan (Appendix 6.7) contains no measures to ecologically enhance areas of cutover bog through rewetting. The applicant's response refers to

the 2020 Draft Rehabilitation Plan (Appendix 6.8) which makes provision for enhancement measures and predicts that 44% of the site will be rehabilitated to support wetland habitats.

The need for replanting of native woodland was also questioned, given that it is likely to increase on the site through natural regeneration and succession. While it is accepted that habitat will replace itself over a period of time, the applicant notes that replanting will speed up the process and lead to a biodiversity gain in a shorter period, which appears reasonable.

Lepidoptera Management Plan

The DoCHG have concerns regarding the side casting of material on the opposite side of proposed infrastructure to where suitable habitat for Marsh Fritillary occurs. It is confirmed in the response that side casting will be undertaken as part of the road construction methodology where floating roads are not proposed. Should side casting be required in the areas surrounding suitable marsh fritillary, the material will be placed on the opposite side to the habitat, which will ensure no encroachment onto the habitat.

I note that the development is designed to avoid areas of suitable habitat, particularly where breeding colonies have been identified in the survey. While there is currently no active management of suitable marsh fritillary habitat at the site, the EIAR commits to ongoing monitoring and management of the habitat to ensure that it does not deteriorate. A Lepidoptera Management Plan is contained in Appendix 6.6 of the EIAR. Subject to the implementation of these measures to monitor and manage existing habitats and the proposal to create suitable areas of additional habitats, no significant effects on marsh fritillary are likely to arise.

Impacts of aviation and other lighting on biodiversity, particularly bat species

The DoCHG raised issues regarding the lack of assessment of the impact of aviation lighting on biodiversity.

Lighting during the construction period will be temporary in nature and only required during winter months. The only permanent lighting is associated with the substation and will be rarely used and small scale.

The EIAR sets out mitigation measures (Appendix 6-2) which will be implemented to protect bats using the site. Where lighting is required, directional lighting will be used to avoid any illumination of any ecologically sensitive areas or overspill on to woodland and forestry. I note that the bat surveys conducted on the site included surveys at height, which revealed very low levels of bat activity, compared to activity at ground level.

Subject to the implementation of the proposed mitigation measures, I do not consider that the provision of aviation lighting is likely to result in significant effects on bats using the site.

Conclusion

I consider that the potential impacts of the proposed development on the biodiversity of the site have been comprehensively assessed in the application and the surveys and assessments have been carried out in accordance with best practice and by competent experts. I consider that the nature and scope of the surveys is acceptable and proportionate.

I accept that the impacts of the proposed development on habitats and species on the site have been reduced by avoidance and design. Habitats rated of higher ecological significance, including areas of raised bog, wetlands and native woodland are avoided by the development and the majority of the habitats that will be impacted are of local importance and low ecological value. The proposed development occupies a very small proportion of a vast bog landscape, with large areas remaining undisturbed and creating opportunities for habitat enhancement.

The habitats present on the site are suboptimal for fauna identified as key ecological receptors including badger, otter and bats. Through standard mitigation and monitoring, management and habitat enhancement for marsh fritillary butterfly, there will be no significant impacts on these species arising from the development.

The proposed development avoids watercourses and no instream works are proposed. The surveys indicate that habitats present are suboptimal for aquatic species identified as key ecological receptors including salmon, lamprey and white-clawed crayfish. The main impact would occur through drainage during both the construction/operational phases. Subject to the mitigation measures proposed which

are standard best practice protocols, significant impacts on the water environment are not predicted.

While the proposal makes provision for the rehabilitation of the bogs which is critical to the restoration of the peatland ecosystem, I accept that more detailed and comprehensive plans are required.

I consider that the information provided in the planning application documents is sufficient to allow the impacts of the proposed development to be fully assessed. I am satisfied that the impacts identified on biodiversity would be avoided, managed or mitigated by the measures forming part of the proposed scheme. I am, therefore, satisfied that the proposed development would not have any direct, indirect or cumulative significant effects on the biodiversity of the area.

9.7. **Ornithology**

EIAR summary

Potential impacts on avian receptors are identified and assessed in Chapter 7 of the EIAR, with particular attention paid to species of ornithological importance, including those with national and international protection under the EU Birds Directive, Red-Listed Species of Conservation Concern and raptors protected under the Wildlife Acts. This chapter is supported by Appendices 7.1 to 7.9 (Volume 3 of EIAR).

The EIAR describes the methodology and assessment approach which consisted of desk top studies and a range of field surveys. The desk top surveys included a review of on-line web-mappers (NPWS, National Biodiversity Data Centre and Irish Wetland Bird Survey), a review of other sources of information including Bird Atlases, Birds of Conservation Concern in Ireland, specifically requested records from NPWS Rare and Protected Species database, and a review of impact assessments associated with nearby developments including wind farms. Consultation took place with An Taisce, BirdWatch Ireland, NPWS, Irish Rapture Study Group, Irish Red Grouse Association, Irish Wildlife Trust, Irish Peatland Conservation Council and the Department of Agriculture Food and the Marine.

Field surveys were carried over a two-year period between April 2018 and September 2019. This data is supplemented by additional data from surveys conducted on the site between October 2014 and September 2017. The surveys included vantage point, walked transects and distribution and abundance surveys for

targeted species as described in the EIAR and supporting appendices. The surveys were designed and undertaken in accordance with Scottish Natural Heritage (SNH) Guidelines 2014[6]. The surveys provided information on the distribution/abundance of species present on the site, areas of suitable habitat, identified roosts, probable/confirmed breeding territories and levels of flight activity. All flight activity was observed and the data collected was used to determine potential collision risks.

Migratory vantage points were also established along sections of the River Shannon and Little Bosna River to monitor the movements of sensitive wildfowl, with an emphasis on Whooper Swan and Greenland white-fronted Goose. The aim was to establish if there was any connectivity between these SPA's and the proposed windfarm development.

The EIAR provides a list of target species (28 no.) likely to occur within the zone of influence of the proposed development. Section 7.4 describes the observations for each target species under the individual survey headings (vantage point, breeding, winter transect/waterfowl surveys, migratory bird surveys, roost surveys etc). Section 7.5 of the EIAR provides an evaluation of the population importance (International/National/county/Local) and the significance of the development site for these species.

The target species list was refined from an analysis of the survey data and species were excluded as they were not recorded on the site, or significant pathways for effects could not be identified. This resulted in a list of species identified as potential Key Ornithological Receptor's (KOR's). These include Annex 1 species, SCI's of designated sites, Red and Amber listed species of Conservation Concern and raptors (Schedule IV of the Wildlife Act 1976). Details of the survey results and maps showing where the KOR's were recorded on the site are provided in Appendix 7.4.

The proposed development is not located within the boundaries of any European or nationally designated sites important for nature conservation. The closes NHA is the Little Brosna Callow which is also designated as an SPA for a variety of bird species, the impacts on which are discussed under Appropriate Assessment below. The

[6] 'Recommended bird surveys methods to inform impact assessment of onshore wind farms', SNH, 2014

remaining NHA's are located at significant distances from the site, ranging from 8.5 km -14.5km and are not likely to be impacted by the proposed development.

EIAR Conclusions:

The EIAR identifies the potential for significant effects on each of the KOR's in terms of direct habitat loss, displacement/ barrier effects and collision (Table 7-12 to Table 7-31). The overall conclusion is that the potential for significant effects is 'slight' in the case of the majority of KOR's, with the exception of breeding lapwing, where the effect is assessed as 'moderate' pre mitigation.

Mitigation will be achieved in the first instance by design and the avoidance of the most sensitive areas for birds (Drinagh wetlands), by minimising the footprint of the development and by best practice construction methodologies (removal of woody vegetation outside the breeding season/replacement with native tree species, controls on noise, construction hours, appointment of ECoW and development of CEMP).

Although no significant habitat loss/displacement effects have been identified, a habitat enhancement plan is proposed (Appendix 7.8 of the EIAR) to provide additional foraging, roosting and nesting habitat, in particular for breeding lapwing, where the significance of effects in classified as 'moderate'. The area comprises approximately 25 hectares and is located on the northern section of the Drinagh wetlands (Fig 1 of Appendix 7.8). This section of poor quality degraded bog has been colonised with birch scrub, which will be rehabilitated to provide breeding habitat. The area will be managed by the removal of scrub and the establishment of a mosaic of semi-natural grassland and poor fen mosaic. The area is selected due to proximity to the wetlands which provide a greater diversity of invertebrate prey for foraging birds.

The plan focuses on the enhancement of supporting habitat for lapwing but will also benefit redshank, black-headed gull, woodcock, ringed plover, whopper swan and snipe. The plan and the proposed management practices are based on successful approaches previously implemented by Bord Na Mona and BirdWatch Ireland to rehabilitate a section of cutaway bog for breeding waders (including lapwing) at Drinagh. Following rehabilitation, the number of breeding pairs increased significantly.

Other mitigation measures proposed include avoidance of construction during the bird nesting season, pre-construction bird surveys and post-construction bird monitoring (Appendix 7.9) of the site and the proposed habitat enhancement area. The programme will monitor parameters associated with collision, displacement/barrier effects and habituation during the lifetime of the project.

Cumulative effects are considered in Section 7.14 of the EIAR. The proposed development was considered in the context of a potential barrier effect in combination with other wind farms in the wider landscape. No important migratory routes for any species were identified during any of the surveys undertaken. The majority of flights involved short distances between foraging, roosting and breeding sites within the study area. Significant cumulative barrier effects are not, therefore, predicted.

No significant effects are predicted on birds due to direct habitat loss or displacement during the construction, operational or decommissioning phases of the proposed development.

Assessment

I inspected the site from the surrounding road network and have had regard to the relevant chapters of the EIAR and the supporting appendices. I have also had regard to the concerns raised by the observers including those raised by the Department of Culture, Heritage and the Gaeltacht. The concerns raised relate to the potential impacts of the development on avian receptors within the site, particularly protected species, and species associated within Drinagh wetlands close to the site and the SPA's further to the west.

There are 7 no. Annex 1 species identified as KOR's with the potential to be impacted by the proposed development, including whooper swan, golden plover, red-necked phalarope, hen harrier, little egrit, merlin and peregrine.

Whooper Swan was recorded on the site in the various surveys but the greatest level of activity and concentration occurred in the Drinagh Wetlands to the east of the site. The only element of the development located in proximity to the wetlands is the proposed amenity pathway. The path follows an existing track and no loss of habitat is anticipated. Small numbers of birds were also recorded foraging/roosting at three locations which overlap with the development footprint (Figure 7.7.1.1. in Appendix

7.4). Whooper swan was recorded flying over the site. It is a qualifying feature of SPA's to the west of the site.

Significant effects during construction/operation arising from direct habitat loss or displacement are not predicted due to the limited overall footprint of the development, the availability of suitable habitat close by and the opportunistic nature of the species, which may not remain loyal to specific habitat areas.

The closest turbine to the Drinagh wetlands is c 900m which exceeds the 600m zone of sensitivity for the species[7]. The survey results indicate that the site does not lie on a migratory corridor for Whooper Swan and accordingly no barrier effect is predicted. Whopper Swan is a qualifying interest of the SPA's to the west but I note that the surveys did not indicate any evidence of birds commuting between the site and the SPA's to the west.

The collision risk has been calculated at a ratio of 0.21 collisions per year (one bird every 6.3 years) which is assessed as negligible.

Golden Plover was recorded predominantly flying over the site. There is no evidence of birds breeding or regularly utilising the habitats within the site boundary. No significant effects with regard to direct habitat loss are predicted during construction/operation. With regard to displacement, the zone of sensitivity for this species is 800m during the breeding season only. Only wintering populations were recorded and the species is not identified as being particularly sensitive to wind farm developments during this period. Significant displacement effects are not therefore predicted during construction.

With regard to displacement during the operational phase, the EIAR refers to studies conducted which found reduced use of habitats around turbines ranging from 175-200m. There is also reference to post-construction monitoring at 15 upland wind farms which showed no significant decline in populations post construction. There are extensive areas of suitable habitat in the wider area, which will mitigate any displacement effects likely to occur.

[7] Bird Sensitivity Mapping for Wind Energy Development and Associated Infrastructure in the Republic of Ireland, Mc Guinness et al (2015).

Golden Plover is a qualifying interest of SPA's to the west but I note that the migratory surveys conducted as part of the EIAR did not indicate any interaction between the development site and populations associated with the SPA's.

The collision risk (14.9 collisions per year) which if it were to occur would increase the annual mortality in the county by 0.44%, which is considered negligible.

Red-necked Phalarope was recorded occasionally on the site (data is confidential). No significant impacts are predicted associated with direct habitat loss or displacement during the construction/operational phases of the development. The species was not recorded in flight during the VP surveys and collision risk modelling cannot therefore be undertaken. The collision risk within the accuracy levels available to the assessment is therefore zero.

Hen Harrier - The majority of observations were over the Drinagh wetlands to the east, with occasional foraging within the site and 500m from turbine locations. Two separately used hen harrier wintering night roosts were recorded, one located 4km from the nearest proposed turbine and the other c 500m from the development site. The birds were only observed entering the roost on one occasion in each instance and there were no observations of birds roosting at any other location within 2km of the development site in subsequent surveys.

Significant effects as a result of direct habitat loss are not predicted during the construction/operational phases having the low level of activity recorded and the abundance of suitable habitat that will remain post construction. Given that hen harrier was not dependent on the habitats located in close proximity to the development infrastructure for foraging, roosting or breeding, it is not considered that there is significant potential for displacement effects.

The collision risk has been calculated at 0.0005 collisions per year, or one bird per 213 years. The collision risk is assessed in the EIAR as insignificant in the context of county, national and international populations.

Little Egret was not recorded regularly within 500m of the proposed turbine locations. The majority were observed foraging, roosting/loafing and flying over the Drinagh wetlands during winter months. Significant effects due to direct habitat/displacement loss both during construction/operation are not therefore predicted.

The species was recorded flying within the potential collision risk zone during the VP surveys. The collision risk was calculated at 0.02 collisions per year or one bird every 61 yearw. The predicted collision risk is assessed as insignificant in the context of County populations.

Merlin was only recorded on 4 occasions between October 2107-Sepetmber 2019, three of which occurred within or partially within the 500m of the proposed turbine layout. There were few observations of the species during earlier winter breeding surveys conducted between 2014/2017. The species was not recorded utilising habitat within the site for foraging/roosting. Significant effects arising due to habitat loss/displacement are not therefore likely to arise.

The species was not recorded flying at the potential collision risk height during the VP surveys and no collision risk modelling can therefore be carried out. The collision risk within the accuracy levels available to the assessment is zero.

Peregrine was recorded regularly foraging over the development site in winter months. There is no suitable breeding habitat for the species on the site and no breeding activity was recorded. No significant effects during construction/operation due to habitat loss or displacement are anticipated. Extensive areas of suitable foraging habitat that will remain post construction and it has been demonstrated that Peregrine habituates to disturbance and is likely to adapt to the wind farm landscape.

The collision risk is negligible, calculated at a ratio of 0.7collission per year or one bird every 14 years, which would increase the mortality rate by 0.4% which is negligible in the context of National populations.

The information provided indicates that the site is used to varying degrees by Annex 1 species primarily for foraging and roosting with limited evidence of breeding. The development footprint occupies a very small percentage of the overall site and vast areas of similar habitat will remain both within the site and in the wider environs to accommodate any species likely to be displaced as a result of habitat loss or disturbance. The collision risk for each species associated with the operating turbines is assessed as negligible/zero. There is no evidence of any interconnectivity between Annex 1 species that occur on the site and the qualifying interests of the adjacent SPA's. This matter is discussed further under Appropriate Assessment.

The Red-listed species of conservation concern recorded on the site include Lapwing, Black-headed Gull, Woodcock, Curlew and Redshank. With the exception of Curlew, the other species have been recorded breeding on the site. Some of the breeding areas were identified within 500m of the infrastructure and some overlap the development footprint (Lapwing), creating potential impacts in terms of habitat loss, disturbance/displacement and collision risk. Recorded Redshank breeding areas are well removed from the site's infrastructure and outside the zone of sensitivity for the species (800m).

Due to the narrow corridor associated with the development footprint and the significant areas of suitable habitat that will remain post construction, both within the development site and the wider area, there is limited potential for significant effects in terms of habitat loss. The potential for displacement of some species is also negligible due to low levels of activity (Curlew/Redshank) or sub-optimal habitat (Redshank). In the case of other species (Lapwing, Black-headed Gull, Woodcock), it is assumed in the EIAR that some displacement may occur during the operational and construction phases of the development, but that this will not be significant due to the extent of suitable habitat in the wider area. In addition, the proposed habitat enhancement plan which is designed to create suitable additional foraging and breeding habitat for species that may experience displacement will mitigate potential effects.

The low rate of collision predicted for each species will not result in significant reductions in species populations.

The other species recorded on the site and identified as KOR's include Amber and Green-listed species such as Buzzard, Sparrowhawk, Kestrel, Snipe, Teal and Ringed Plover.

Sparrowhawk, Kestrel, Snipe and Teal breed on the site and some of the breeding areas are overlapped by the development footprint. The species display different tolerances to windfarms with Buzzard and Snipe displaying significant avoidance extending up to 500m and 400m respectively. Kestrel, on the other hand will continue to forage close to turbines. Arising from the limited land take associated with the development and the significant areas of suitable foraging and nesting habitat that will remain both within the site and in the wider area, significant effects

associated with habitat and displacement during the construction/operational stages are not anticipated in the EIAR. Furthermore, the low rate of collision predicted for each species will not result in significant reductions in species populations.

The DoCHG does not raise any specific concerns regarding potential impacts on species within the site arising from habitat loss, displacement or collision. It's focus is on ground nesting species recorded breeding/potentially breeding within the site and the potential disturbance that may arise from amenity infrastructure. It also refers to potential disturbance to 2 no. recorded occasional hen harrier winter roost sites, one within and one immediately adjacent to the site.

The ground nesting species referred to include, Black-headed Gull, Redshank, Lapwing, Woodcock, Snipe and Ringed Plover. The surveys indicate that with the exception of Redshank, some breeding areas for the remaining species overlapped with the development footprint and some lie close to the proposed amenity trails to the east (Black-headed Gull, Redshank, Ringed Plover). The DoCHG identifies threats posed by dog walking, particularly dogs off leads, as a significant cause of disturbance to ground nesting species.

The hen harrier roosts site are identified in the EIAR (Fig 7.6.1.1. of Appendix 7.4). One roost site was recorded to the north east of T1 and is well removed from the windfarm infrastructure and not adjacent to any proposed amenity paths. The second was identified to the east of the site, also well removed from the turbine locations, but close to a proposed amenity trail. The path would extend westwards from the R437 adjacent to the bog railway.

The amenity tracks have been designed largely to utilise existing tracks throughout the site to minimise habitat loss. They avoid areas of sensitivity such as wetlands and no significant disturbance to any species, including hen harrier has been identified in the EIAR. To address the concerns the applicant proposes to erect signage around the pathways informing the public of the wildlife and the importance of staying on the tracks and keeping dogs on leads. Monitoring will be undertaken and should there be any signs of disturbance, various measures will be enforced such as banning dogs, or closure of paths either temporarily or permanently.

During my inspection of the site, I did observe walkers using the existing link into the bog to the east, which together with the railway means that the area is already

subject to some level of disturbance. While I accept that developing the amenity trails is likely to attract additional walkers into the area, having regard to occasional and limited use of the roost site, I consider that the provision of signage and continuous monitoring is likely to be adequate to mitigate disturbance to hen harrier.

The location of the site close to designated sites and wetlands is questioned by some of the observers. It is contended that the application should be refused due to the variety of bird species recorded on the site, including Annex 1 species. The site is not located within a European site, but there are a number of SPA's in close proximity and their qualifying interests, together with other species of conservation concern are included on the target list of species for the purposes of assessment. The Key Ornithological Receptors identified include some Annex 1 species and the impacts on these birds are fully assessed in the EIAR. From the range of surveys conducted, there is no evidence that the proposed development will impacts on any of the qualifying interests of the SPA's. This is discussed in greater detail below under Appropriate Assessment.

Drinagh Wetland is located to the east of the site and consists of 187ha of permanent wetland. It provides nesting, roosting and foraging habitat for a significant number of bird species and is not covered by any specific designation. While the development site is used by species which also use Drinagh wetlands, there is no evidence that significant effects will occur arising from the construction/operational phases of the development which will impact on populations within the wetlands.

Conclusion

The site provides a valuable habitat for a wide range of birds including species listed on Annex 1 on the Birds Directive, Red and Amber Listed Species of Conservation Concern and species protected under the Wildlife Acts. I consider that the information provided in the EIAR, which is supported by a range of surveys, which were undertaken in accordance with best practice guidance, and are comprehensive and proportionate, is sufficient to allow the impacts of the proposed development to be fully assessed.

While I accept that the development of the windfarm on the site will impact on bird species foraging, roosting and nesting within the site, the development has been designed to avoid the most ecologically sensitive areas. The proposed development

occupies a limited footprint within the overall site with vast areas of similar habitat remaining both within and in the immediate surroundings. Subject to the mitigation measures proposed in the EIAR, which include habitat enhancement measures (Lapwing, Waterfowl and Habitat Enhancement Plan) and monitoring, I do not consider that the proposed development will result in significant effects on birds in terms of habitat loss, displacement or collision risk.

The impacts on Annex 1 species, including those which are qualifying interests of adjacent SPA's has also been assessed and no potential for significant effects have been identified. This matter is considered in more detail under Appropriate Assessment.

I consider that the information provided in the planning application documentation is sufficient to allow the impacts of the proposed development to be fully assessed. I am satisfied that the impacts identified on ornithology would be avoided, managed or mitigated by measures forming part of the proposed scheme and I am, therefore, satisfied that the proposed development would not have any unacceptable direct or indirect impacts on bird species that use the site.

9.8. **Land, Soil and Geology**

EIAR summary

The potential impacts of the proposed development on land, soils and the geological environment are assessed in Chapter 8 of the EIAR. This should be read in conjunction with the Geotechnical and Peat Stability Assessment Report included as Appendix 8.1.

Information on the existing environment was obtained from a desk top study, a walk over survey and site investigations. The desk top study included a review of data sources from Bord Na Mona databases on peat depth/drainage, EPA database, and GSI mapping and data bases (groundwater and geology, bedrock geology, general soil map, geological heritage site mapping). The walk over surveys included detailed drainage mapping and baseline monitoring/sampling. Geotechnical ground investigations and a peat stability assessment were also undertaken.

The published soils map for the area shows that the site is entirely covered by cutover peat (Fig 8.1). Information on peat thickness across the site was obtained from the ground penetrating radar surveys carried out by Bord na Mona in 2015 (Fig

8.4) and from ground investigations (Fig 8.2), which included gouge core samples and trial pits to determine the depth of peat and the nature of the underlying subsoils (Table 8.4). Peat thickness within the proposed development footprint is generally less than 2m with localised deeper deposits of up to 4.7m. The average recorded peat depth across Clongawny bog is 1.39m and across Drinagh Bog is 0.7m. Peat depths at the proposed substation location vary between 0.3 and 1.1m.

Trial pits were also completed at each of the turbine locations (Fig 8.6). The mineral subsoil underlying the peat at the proposed turbine locations typically comprise shell marl, lacustrine deposits and glacial tills. At the proposed substation, underlying subsoil is logged as soft to firm grey sandy clay. A summary of peat depths and mineral subsoil lithology at the proposed turbine locations is shown in Table 8.4.

Based on GSI bedrock mapping the bedrock underlying the proposed development site comprises Dinantian Pure Unbedded Limestone (Fig 8.7). No bedrock was encountered in any of the site investigation points. Depth to bedrock is expected to be between 6-12mbgl.

There are no recorded mineral deposit sites or mining sites (current or historic) within the proposed development area. There are 2 no. County Geological Sites near the proposed site (Drinagh and Crancreah Mushroom rocks) and I no. within the site (Derrinlough Mushroom Rock). The locations of these sites are shown on Fig 8.8. These geological sites consist of limestone standing rock which have been eroded from the base from acidic waters.

Peat Stability Assessment

The hand vane results indicate undrained shear strengths in the range 20 to 120kPa, with an average value in the region of 65kPa. These strengths are considered to be typical of well-drained peat as is present on the site and are significantly higher than peat strengths at sites of known failures[8]. Slope inclinations at the main infrastructure locations range from 0 to 4 degrees, reflective of the relatively flat nature of the topography.

A Peat Stability Assessment was carried out to determine the stability of the existing peat slopes and identify areas of peatland that are suitable for development. The

[8] Derrybrien undrained shear strength estimated at 2.5 kPa

assessment follows the principles set out in *'Peat Landslide Hazard and Risk Assessment: Best Practice Guide for proposed Electricity Generation Developments'* (PLHRAG, 2017). The assessment is contained in Appendix 8.1 of the EIAR. The following is a summary of the data and conclusions contained in the report.

This best practice guide details a number of approaches to estimating the likelihood or probability of a peat slide. For the purposes of this assessment the 'deterministic approach' was adopted where the likelihood of the failure of a peat slope is expressed as a Factor of Safety (FoS). An acceptable Factor of Safety (FoS) for slopes is generally taken as a minimum of 1.3, which is based on BS6031:1981: Code of Practice for Earthworks (BSI, 2009).

To assess the Factor of Safety for a peat slide, undrained and drained analysis was undertaken. The undrained condition applies in the short-term during construction and until construction induced pore water pressures dissipate. The drained condition applies in the long term and the purpose of its analysis is to identify the relative susceptibility of rainfall induced failures at the site. The analysis was carried out at the turbine locations, substation compound, construction compounds and met masts. The results of the analysis for the undrained and drained loading condition are contained in Table 8.6 and Table 8.7 respectively of the EIAR.

The undrained analysis indicates that all locations generally have an acceptable FoS of greater than 1.3, indicating a low risk of peat failure. This is considered the most critical condition for the peat slopes as most peat failures occur in the short term upon loading of the peat surface. For the drained condition, the calculated values were above the minimum acceptable FoS of 1.3 at all but two of the 579 locations analysed. These are located alongside the proposed access road between T12 and T13 where the proposed works entail the construction of a floated section of road with no excavation works proposed. Peat instability at these locations is not envisaged to be an issue.

The findings of the assessment shows that the wind farm site has an acceptable margin of safety and is considered to be at low risk of peat failure. The peat stability risk assessment (Appendix B) identifies a number of mitigation/ control measures to reduce the potential risk of peat failure at each infrastructural location. It is stated in the EIAR that sections of access roads to the nearest infrastructure element should

be subject to the same mitigation/control measures that apply to the nearest infrastructure element.

Likely significant effects during construction stage/mitigation measures

The proposed development will involve removal of peat and subsoils for access roads, internal access road networks, internal cable network, hardstand emplacement, turbine foundations, substation, crane hardstands, construction compounds and met mast installation. The volumes of materials that will be removed are estimated in Table 8.8 of the EIAR (392,684m3 peat and spoil). The construction works will generate a requirement for construction material including gravel and sand (484,600m3) which will be imported from local quarries (Figure 4.23 of the EIAR). A summary of the construction method associated with each element of the development is provided in Table 8.10.

The potential impacts on land and soil that could arise during the construction phase are identified as follows:

- peat and subsoil excavation
- soil contamination
- soil erosion
- peat instability and failure
- piling works
- impacts on geological sites

Removal of peat and subsoil – the construction phase will involve the permanent removal of in-situ peat and subsoil at most excavation locations. To minimise potential effects, mitigation will achieved by design. This includes locating turbines and other infrastructure in areas of shallower peat where possible and the use of floating roads where appropriate to reduce the volumes of peat to be excavated. While the excavation of peat and soil will be highly localised to the vicinity of the proposed infrastructural works, it will result in the removal of an estimated 392,684m2 of material being disturbed on the site. The excavated material will not be lost as it is intended to relocate it within the site. This is considered to be the most environmentally sensitive and stable way of handling and moving excavated peat,

based on Bord Na Mona's experience. The material will only be moved short distances from the point of excavated and will be used locally for landscaping. The construction of settlement ponds will be volume neutral with all excess material to be used locally to form pond bunds and surrounding landscaping.

The proposed development footprint will occupy only a small percentage (1.45%) of what is an extensive site. The material will be relocated across the site with no loss of peat/subsoils associated with the proposed development. No significant effects are anticipated.

Soil contamination - there is a potential risk of contamination of peat/soil by leakages and spillages from hydrocarbons and chemicals stored on the site. In accordance with standard operating practice, best construction methodologies will be employed to reduce this potential including the use of bunded areas for fuel storage, maintenance of spill kits on the site, inspection of plant for leakages/spillages, implementation of appropriate measures for re-fuelling plant on the site and the development of an emergency response plan. Subject to the implementation of these measures, the risk of contamination of land and soils is low and no significant effects are likely to arise.

Soil erosion - it is accepted in the EIAR that there is a high likelihood of erosion of peat and spoil during excavation and landscaping works, with the potential for impacts particularly on the water environment. Soil and peat could potentially be eroded by vehicle movements, wind action and water movement.

To mitigate these effects, all excavation works will be completed in accordance with the Peat and Spoil Management Plan (Appendix 4.2 of the EIAR). Materials will be moved the least distance possible within the site and excavated peat will be used for landscaping close to the excavation. To encourage plant growth at the surface of the peat storage areas it is proposed to retain the upper vegetative layer where it exists. Re-seeding and planting will be carried out to bind landscaped peat and spoil together.

Following the implementation of the mitigation measures the residual effect is assessed as negative, slight short-term with a medium probability effect on peat and subsoils and bedrock.

Peat instability and failure - the significant mass movement of a body of peat would have the potential to impact on the windfarm development and the surrounding environment. It could result in death /injury to site personnel, damage/loss of machinery/ infrastructure, contamination of watercourses and degradation of the peat environment by relocation of peat and soil. As noted above the findings of the peat stability assessment showed that the proposed wind farm has an acceptable margin of safety and is considered to be at low risk of peat failure.

Recommendations and control measures will be incorporated into the construction phase of the project to assist in the management of potential risks for this site. These include the appointment of experienced and competent contractors, supervision of the site by experienced and qualified personnel. Other measures will include prevention of undercutting of slopes and unsupported excavations, maintenance of a managed robust drainage system, prevention of placement of loads/overburden on marginal ground, development of construction methodology for agreement prior to construction which will be followed by the contractor, setting up, maintenance and reporting of findings from monitoring systems and revision and amendment of the Construction Risk Register as construction progresses to ensure that the risks are managed and controlled for the duration of construction.

Subject to the implementation of these mitigation measures which will assist in the management of risks for the site, the no significant effects on soils/subsoils are likely to occur.

Piling works - it is acknowledged that some of the turbine and infrastructure locations may require piled foundations. Other than surface level and minor excavation works, any piling would not produce significant volumes of spoil as the proposed piling system are driven piles which displace soil/subsoil within the ground. This small displacement would not alter ground levels, nor change the local geological environment in any significant way. No significant effects on soils/subsoils are anticipated from piling works and no mitigation measures are required.

Impacts on geological sites – There will be no impacts on the 2 no. County Geological Sites (CGS's) near the site as there will be no construction or operational works in these locations and no mitigation measures are considered necessary. The

Derrinlough Mushroom Rock which is within the development site will be cordoned off and no works will take place within 30m of the site. The mitigation measures will be incorporated into the CEMP and access roads will be kept a minimum of 30m from the rock. Subject to the implementation of these mitigation measures, no impacts are likely on any CGS's.

Other works – The development will also involve the provision of a substation, two permanent underpasses, proposed amenity links and junctions works at Kennedy's cross which will involve excavation of peat and soils. The proposed construction methodology for the pathways will be by floating road construction with no requirement for additional excavation or spoil generation. With regard to the other works, similar mitigation measures will be employed regarding management and reuse of excavated material, measures to prevent soil contamination etc. No significant effects are anticipated.

Likely significant effects during operational stage/mitigation measures

There will be very limited impacts that could arise during the operational phase that could give rise to significant effects on soil/subsoil. These impacts would be associated with accidental leaks/spills associated with vehicles/plant involved in maintenance on the site, spills/leaks of oil from transformers in turbines/substation which are oil cooled, or, indirect impacts associated with the application of a small amount of gravel material to maintain access tracks, which will place intermittent minor demands on local quarries. None of these impacts are considered significant as they are small scale and of an intermittent nature.

Mitigation measures during the operational stage include the use of aggregate from authorised quarries for road and hardstand maintenance. The substation transformer would be in a concrete bund capable of holding 110% of stored oil volume and any leaks from the turbines would be contained within the turbine (transfomers are housed within the turbines). These mitigation measures are considered adequate to eliminate potential risk to ground/peat/soils/subsoils and ground and surface water quality.

Likely significant effects during decommission stage/mitigation measures

The potential impacts associated with the decommissioning stage are considered to be similar to those associated with construction but of reduced scale. Some of the impacts would be avoided by leaving elements of the development in place as appropriate. The substation would be retained by EirGrid. The turbine bases would be covered with local topsoil/peat in order to regenerate vegetation which would reduce runoff and sedimentation effects. Internal roads would remain as amenity pathways. Mitigation measures to avoid contamination by accidental fuel leakage and compaction of soil by on-site plant will be implemented as per the construction phase mitigation measures. No significant effects on the soils and geology environment are anticipated during the decommissioning stage of the proposed development.

Cumulative effects

Due to the localised nature of the construction works which will be contained within the proposed development site, there is no potential for significant cumulative effects in combination with other developments on the land, soils and geology environment.

Assessment

The Geological Survey of Ireland state that attention should be given to the possible impacts of the proposed development on Geological Heritage Sites including Mushroom Rocks and the Kilcomac Esker system which runs to the south of the proposed development.

As noted above, the only potential impacts that could arise relate to the Derrinlough Mushroom Site. It is located c 60m to the south of an existing internal access track which will be upgraded and used as part of the development. Subject to the application of the development buffer around the site during the construction stage, no significant effects on the GSI are likely to arise.

The EIAR does not specifically refer to the esker system which runs east-west to the south of the site. The applicant's response confirms that it lies a minimum of 600m from the boundary of the application site. There will be no works close to the site which would impact on the esker. I note that the works proposed to the junction of the N52/N62 will be closer (300m), but no excavation or construction works will occur within the mapped esker footprint which would give rise to significant effects.

The GSI also refers to geohazards. There are no recorded landslides in the vicinity of the site on the GSI database. The peat stability assessment referred to above suggests that the site has a low risk of peat failure.

Conclusion

The findings of the geotechnical and peat stability assessment report which has been prepared in accordance with best practice guidance suggests that the site is suitable for a wind farm development and is at low risk of peat failure. Impacts on land and soil is mitigated by design and the avoidance of deeper areas of peat, the use of floating roads where possible and the reuse of excavated material within the site. Subject to mitigation there will be no impacts on any CGS's on, or, in the vicinity of the site.

I consider that the information provided in the planning application documents is sufficient to allow the impacts of the proposed development to be fully assessed. I am satisfied that the impacts identified on lands, soils and geology would be avoided, managed or mitigated by the measures forming part of the proposed scheme. I am, therefore, satisfied that the proposed development would not have any direct, indirect or cumulative significant effects on these environmental factors.

9.9. **Hydrology & Hydrogeology**

EIAR summary

The potential significant effects of the proposed development on the water environment are considered in Chapter 9 of the EIAR. The assessment describes the existing environment and identifies the likely significant effects on surface water and ground water during the construction, operational and decommissioning stages of the proposed development. This chapter is supported by Appendix 9.1 (Flood Risk Assessment) and Appendix 9.2 (Water Analysis).

The EIAR provides details of desk top studies and site investigations/baseline monitoring conducted to describe the receiving environment. The desk top study involved collecting all relevant geological, hydrological, hydrogeological and meteorological data for the area using recognised data bases, records, reports and map viewers. Site investigations included walkover surveys, hydrological mapping and baseline monitoring and sampling. The information gathered was collated with

the geotechnical ground investigations and peat stability assessment compiled for Chapter 7 (Land & Soils).

The site consists of two bogs with an overall area of c 2360ha. The majority of the overall site comprises heavily drained cutover raised bog. The topography of the development site is relatively flat with an elevation ranging from 53 and 62mOD. Along the majority of the site boundaries, a 1-2m high headland exists which is a remnant of the original bog. This together with remnant peat banks creates a boundary berm, forming a basin effect within the extraction areas of the overall bogs. There are some areas of higher ground at the centre and southwest of Clongawny bog and these are covered with coniferous forestry.

The existing drainage network at the site comprises field drains, larger arterial drains and perimeter settlement ponds. The surface of each bog is drained by a network of drains which are spaced at 15-20m. Large arterial drains connect the field drains and collect run-off water from these drains. Surface water draining/pumped from the site is routed via large settlement ponds prior to discharge to off-site drainage channels which flow into the local rivers (Little River, Silver River). With the exception of the northern outfall at Clongawny Bog, all other outfalls are drained by gravity.

There are 3 no. pumping station across the two bogs as shown on the site drainage map (Fig 9.3), with the maximum discharge designed to be below greenfield run-off rates and are rated for removal of rainfall events equivalent to 15mm in I hour (approximately 5-year return period). The baseline run-off from the site is calculated at 64,798m3/day.

Regionally the proposed development is located in the River Shannon surface water catchment (Fig 9.1). On a more local scale, the majority of the site is located in the Brosna River sub-catchment (Fig 9.2). The Little River flows in a north-westerly direction through the centre of the site and discharges to the Brosna River, which flows west and discharges into the River Shannon. The Silver River runs along the eastern boundary of the site and also flows into the Brosna River. To the west a number of small tributaries flow west/southwest before joining the Rapemills River, which enters the Shannon west of Banagher.

A Flood Risk Assessment was undertaken for the proposed development. No recurring flood event were recorded within the site. The vast majority of the site lies outside the 1 in 100-year flood zone (Flood Zone A) with the exception of a section on the north-eastern corner of the site (Plate 9.2). The PFRA also shows the extent of pluvial flooding and it occurs along the main drainage channels within the site. This is a result of surface water run-off backing up in the drainage routes when the capacity of the outfalls is exceeded.

The CFRAM OPW Flood Risk Assessment Maps indicates that the site is located within Flood Zone C, where the probability of flooding is low. The site is therefore considered suitable for the proposed development in terms of flood risk. The full flood risk assessment is contained in Appendix 9.1of the EIAR.

With regard to surface water quality, biological Q-rating date from EPA monitoring points on the Silver, Little and Rapemills rivers show that the Q-ratings for the rivers range from ‘Poor’ to ‘High’ in the vicinity of the site. Chemical analysis of surface water quality downstream of the proposed development was also undertaken using 10 no. sampling locations (Fig 9.5). With the exception of ammonia/nitrate, the other parameters (total suspended solids, nitrite, ortho phosphate, phosphorous, nitrogen chloride and BOD) are in compliance with relevant EQS standards (Table 9.10 and 9.1.)

Regarding hydrogeology, the limestone bedrock which underlies the site is overlain by thick lacustrine and glacial deposits which are in turn overlain by cutaway/cutover peat. Due to the presence of the overlying peat and the low permeability of the underlying lacustrian deposits, groundwater movement through the glacial deposits will be relatively slow unless higher permeability sands and gravels are present.

The vulnerability of the bedrock aquifer is classified as ‘Moderate’ and there is low potential for groundwater dispersion and movement with the aquifer. Therefore, surface water bodies such as drains and streams are more vulnerable than groundwater at the site. There is no groundwater quality data for the proposed site and groundwater sampling would not be generally undertaken for this type of development as ground water quality impacts would not be anticipated given the low potential for groundwater dispersion and movement within the aquifer.

Both groundwater bodies beneath the site are assigned ‘Good’ status. The eastern section of the site is drained by the Silver River which achieved ‘moderate’ status under the Water Framework Directive 2013-2018. The centre of the site is drained by the River Little (Cloghan) which achieved ‘Good’ status. Both of these rivers discharge to the River Brosna which also achieved ‘Moderate’ status and the Rapemills River which flows west of the site has not been assigned a status under the WFD.

The EIAR details (Map 9.6) the designated sites in the vicinity and the potential for hydrological and groundwater connectivity (Table 9.14). There is potential for indirect hydrological linkages via surface water flow but groundwater connectivity is limited due to separation distances, hydraulic boundaries, shallow depth of proposed works differences in elevation etc. The impact of the development on designated sites is considered in more detail below under Appropriate Assessment.

With regard to water resources, the Banagher Public Water Supply Scheme is located west of the site and 2km southeast of Banagher. The mapped source protection zone for this water scheme does not fall within the proposed development site boundary. There are some wells identified in the area including those associated with Bord Na Mona works and Erin Peat (Fig 9.6). It is acknowledged that there are accuracy problems associated with GSI mapped wells and it is therefore assumed for the purposes of the assessment that every private dwelling in the area (shown on Fig 9.7) has a well supply.

Proposed Drainage System

The EIAR identifies surface water as the main sensitive receptor due to the nature of the proposed development involving near surface activities. The cutover peat and silt dominated glacial deposits act as a protective cover to the underlying bedrock aquifer. The EIAR details comprehensive surface water mitigation and controls to ensure protection of downstream waters.

The control of run-off and drainage management are identified as key elements in terms of mitigation against impacts on surface water bodies. Two methods will be employed. The first method involves ensuring that clean water on the site stays clean by avoiding disturbance to existing drainage features, minimising works near

artificial drainage features and diverting clean surface water around excavations, construction areas and temporary storage areas.

The second method involves collecting any drainage waters from works within the site that carry silt/sediment/nutrients. Run-off from access tracks, turbine bases and developed areas (construction compounds, substations and met masts) will be collected and treated in new proposed silt traps and settlement ponds prior to controlled diffuse release into the existing drainage network. From here the water will flow towards the relevant bog site boundaries in existing field/main drains and will be further treated in the existing main settlement ponds prior to discharge from the site. There will be no direct discharges to existing drains.

The proposed drainage system will be integrated into the existing bog drainage system and will not significantly alter the existing drainage regime on the site. A schematic of the proposed site drainage management is shown in Plate 9.4 and a detailed drainage plan showing the layout of the proposed drainage design elements is shown in Appendix 4.5 of the EIAR.

Likely significant effects during construction stage/mitigation measures

There are a number of construction activities with the potential to impact on surface water and groundwater which are broadly identified as follows:

- Earthworks and release of suspended solids in surface water.
- Impacts on groundwater levels during excavation works.
- Excavation dewatering and potential impacts on surface water.
- Underpass dewatering and potential impacts on surface water quality and groundwater levels.
- Release of hydrocarbons/fuels and potential surface water/ground water contamination.
- Impacts on hydrologically connected designated sites.
- Potential impacts of the proposed amenity links/ haul route junction works.

Earthworks and release of suspended solids in surface water - varying degrees of earthworks will be required for the constituent elements of the proposal which will result in the excavation of peat and mineral soils. This creates the potential for the

release of suspended solids to surface water with impacts on watercourses downstream of the site. The impacts would arise from an increased sediment load resulting in increased turbidity and impacts on water quality and fish stocks.

Mitigation will in the first instance be achieved by avoidance of sensitive hydrological features where possible, by the application of buffer zones (50m to main watercourses, 10m to main drains). All of the key proposed development areas are located significantly away from the delineated 50m buffer zones with the exception of the upgrading of the existing watercourse crossing, new drain crossing and upgrades to existing site access tracks. Additional controls will be undertaken in these areas, as outlined below.

Mitigation will also be achieved by design. The proposed drainage system will be used in conjunction with the existing drainage system to ensure that surface water downstream of the site is protected. This will be achieved through source controls, in-line controls and treatment systems using a range of measures including interceptor drains, diversion drains, temporary sumps/attenuation lagoons, sediment traps and settlement ponds etc.

Construction will only take place during periods of low rainfall to minimise runoff rates and the entrainment of suspended solids in surface water runoff. To control runoff from peat/soil storage areas excavated peat will be used for landscaping close to its original extraction point. An inspection and maintenance plan for the on-site drainage system will be prepared in advance of the works and will be included in the CEMP. During the construction phase field testing and sampling and laboratory analysis of a range of parameters with relevant regulatory limits and EQSs will be undertaken for each primary watercourse and especially following heavy rainfall events.

In the absence of mitigation there is potential for earthworks associated with construction to result in the release of suspended solids to the surface water environment. The potential will be reduced by avoidance and design and the use of best practice and proven measures to mitigate the risk of releases of sediment to downstream watercourses. It is considered that these measures will break the pathway between the potential sources and the receptor and no significant effects on surface water quality are anticipated.

Impacts on ground water levels during excavation - small scale dewatering may occur at some excavations such as turbine bases and cable trenches, with the potential to affect groundwater levels. However, these reductions will be temporary and very localised and of small magnitude due to the nature and permeability of the local peat and subsoil geology, which comprises moderate to low permeability lacustrine and glacial deposits. It is considered that water levels impacts are unlikely to be significant beyond 50m from any excavation.

Mitigation will be achieved by design including large separation distances from the works to local houses and associated wells (at least 750m), from main streams and rivers (at least 200-500m) and the proposed underground trench will only be c 1.2m deep and will only potentially interact with perched shallow water within the peat profile. No interaction with deeper regional groundwater will occur. No impacts on the local groundwater table or flows are likely from this element of the development.

Due to the large separation distances between the works and wells and local streams and rivers, and the relatively shallow nature of the proposed works and the prevailing geology, the potential for water level drawdown impacts at receptor locations is considered negligible. No significant effects on groundwater levels are anticipated as a result of the proposed development.

Excavation dewatering and potential impacts on surface water – it is acknowledged that groundwater seepages are likely to occur in turbine bases, substation and construction compound excavations. Inflows are likely to require management and treatment to reduce suspended solids and impacts on water quality downstream of the site.

Mitigation will be by design and will involve the development of interceptor drainage, to prevent upslope surface water from entering excavations. This will be discharged to the existing drainage system or onto the bog surface. Pumping may be required to prevent a build-up of water in the excavations and this which will be discharged via volume and sediment attenuation ponds adjacent to the excavation areas, or by specialist treatment system (Siltbuster). There will be no direct discharge to the existing drainage system and therefore no risk of hydraulic loading or contamination will occur. Daily monitoring of excavations will be carried out by a suitably qualified

person and if high levels of seepage occur, excavation work will cease and a geotechnical assessment will be undertaken.

No significant impacts on surface water quality are predicted from dewatering during excavation. Best practice mitigation measures which are proven to mitigate the risk of releases of sediment are proposed which will break the pathway between the source (works) and the receptor (down-gradient surface water bodies).

Underpass dewatering and potential effects on surface water quality and groundwater levels - Two underpasses are proposed, which will require a limited works area and the duration of the works will be short e.g., 4-8 weeks. Excavation depths will be between 3m and 6.5m. Temporary dewatering may occur in these locations with the potential to impact on groundwater levels by drawdown. The trial pits excavated close to the underpass locations revealed a moderate groundwater inflow at 3.3mblg in one location and no significant groundwater inflows were recorded at the other.

The potential for impacts on the groundwater levels during construction via drawdown is considered to be limited due to the local hydrogeological regime and the remoteness of the underpass locations from groundwater wells. Any temporary dewatering will be treated and discharged to local surface water. Similar mitigation measures to those described above will be employed to manage excavation seepages and subsequent treatment prior to discharge into the drainage network.

The installation of permanent underpasses in the glacial deposits will require permanent dewatering/gravity drainage arrangements. Due to the separation distance between the underpass locations and the groundwater wells, the relatively shallow nature of the proposed works and the prevailing geology, the potential for water level drawdown is considered to be negligible. Surface water quality will be maintained by controls for water treatment prior to release to surface water. No significant effects for surface water quality and ground water levels are predicted.

Potential release of hydrocarbons/cement - the spillage or accidental release of hydrocarbon/cement and other products has the potential to result in a significant risk to groundwater, surface water and to biodiversity. There are proven and effective measures to mitigate these potential impacts which will be implemented during construction. These include bunding of fuel/oil/chemical storage areas, measures to

deal with accidental spillages, ready mix supply of wet concrete products, use of precast elements for culverts and concrete works where possible, washing of concrete plant off-site etc. Subject to the implementation of these mitigation measures, significant impacts on surface or ground water quality are not predicted.

Section 9.5.3.9 considers the risk to any well source down-gradient of a turbine location from a potential contaminant release. The closest upgradient turbine is 750m from the nearest dwelling. Due to the relatively low bulk permeability of mineral soils beneath the peat, the low recharge characteristics (due to overlying peat) and the low groundwater gradient (flat topography), groundwater travel times are expected to be low. As noted in the EIAR during this time any discharge would be assimilated and attenuated by natural groundwater flow and diluted by rainfall recharge. Any entrained sediment would be filtered within the low permeability subsoils. It is concluded therefore that the risk posed to potential well sources at this distance from potential spills and leaks from excavations is negligible.

Impacts on hydrologically connected designated sites – No significant hydrological or hydrogeological effects on designated sites have been identified. This matter is discussed in more detail below under Appropriate Assessment.

Potential impacts of the proposed amenity links/ haul route junction works - amenity pathways (18km) will be provided as part of the proposed development. These will be mainly located on the proposed internal road network. The amenity pathways will have a gravel/crushed stone finish surface. The roads will be re-purposed following construction to form the pathways and will also serve for maintenance access post construction. In addition, 6.5km of dedicated amenity pathways are proposed to provide access points/links in and out of the site and to a car park for recreational use. A new road will be constructed on private lands close to the junction at Kennedy's Cross to facilitate the delivery of turbine compounds and other abnormal loads.

The pathways/new road will require the extraction/excavation of soil and subsoil with the potential for silt/sediment release. Detailed measures have been outlined above for sediment control, release of hydrocarbons/ cement etc which will be implemented as part of the scheme. Subject to the implementation of these measures not significant impacts on surface/ground water quality are anticipated.

Likely significant effect during operational stage/mitigation measures

The proposed development will result in the replacement of peat/vegetated surface with impermeable surfaces with the potential to increase surface water run-off and increase flood risk downstream. It is predicted that the total site increase in surface water run-off will be 1,213m3/month (Table 9.17). This represents a potential increase of approximately 0.06% in the average daily/monthly volume of runoff from the site in comparison to the baseline pre-development site runoff conditions (Table 9.6). This is a small increase in average run-off and results from the naturally high surface run-off rates and the relatively small area of the site being developed, representing 1.45% of the total area of the site.

This increase in volume is low when considered in the context of the potential runoff from the site which is naturally high (96%). It also assumes a worst-case scenario e.g. that all hardstand areas will be impermeable which will not be the case as the access roads will be constructed of permeable stone aggregate. It is concluded in the EIAR that the increase in run-off will be negligible even before mitigation measures would be put in place.

Mitigation will be achieved by design. Run-off from the proposed infrastructure will be collected locally in new proposed silt traps, settlement ponds and vegetated buffer areas prior to release into the existing drainage network. The new drainage measures proposed as part of the development will create additional attenuation works in conjunction with the existing drainage system and will work in conjunction with the existing drainage system on the site.

According to the data provided in the EIAR the net effect of the additional attenuation measures will be a reduction in the overall runoff coefficient of the bog (Table 9.18). It is estimated that there would be a potential 11.4% reduction in runoff volumes from the site arising from the proposed development. It is concluded that there will be no risk of exacerbated flooding down-gradient of the site as a result of the proposed development as water will be retained within the bog for longer periods.

The potential for silt-laden runoff is significantly reduced during the operational stage of the development. All permanent drainage controls will be in place. Potential sources of sediment laden water would only arise where new material is added during maintenance works. There is also a risk associated with release of

hydrocarbons from site vehicles although it is not envisaged that any significant refuelling will be undertaken during the operational stage. The mitigation measures for sediment and control of hydrocarbons will be similar to those employed during the construction stage and no significant effects on surface water quality are predicted.

A groundwater well will be installed adjacent to the substation. Bottled water will be supplied for drinking. The proposed abstraction rate from the well will be small as there will only be intermittent use of facilities at the substation. A worst-case abstraction rate of 1m3/week is assumed for the purposes of the assessment. Based on the separation distance to the nearest dwelling (340m), prevailing geology and the very low abstraction rate proposed, no significant impacts on local groundwater supplies are predicted and no mitigation measures are deemed necessary.

Potential health effects are considered in the context of contamination of public/private water supplies and potential flooding. There are no mapped public or group water protection zones mapped in the area of the proposed wind farm site. The Banagher public water scheme is located to the west and its mapped protection zone lies outside the site boundary. It is concluded in the EIAR that the site design and mitigation measures are adequate to ensure that potential impacts on the groundwater environment are not significant.

Flood water have the potential to carry waterborne disease and contamination/effluent. A Flood Risk Assessment has shown that the risk of the proposed windfarm contributing to down stream flooding is very low, as the long-term plan for the site is to retain and slow down drainage water within the existing site. The on-site drainage control measures will ensure no downstream increase in flood risk.

Likely significant effect during decommissioning stage/mitigation measures

The potential impacts associated with the decommissioning stage would be similar to those associated with construction, but of a reduced magnitude as the scale of the works will be reduced. As outlined in earlier sections of the report, it may be possible to reverse some of the potential impacts caused during construction by rehabilitating areas such as turbine bases and hard standing areas and by leaving elements of the proposed development in place where appropriate. Mitigation measures to avoid

contamination by accidental fuel leakage and compaction of soil by on-site plant will be implemented as per the construction phase mitigation measures.

No significant effects on the hydrological or hydrogeological environment are envisaged during the decommissioning stage of the proposed development.

Cumulative Effects

The cumulative assessment considered other wind farm and non wind farm developments within a 20km radius and inside the River Shannon Catchment. The wind farm developments are listed in Table 9.19 and shown in Figure 9.8.

The implementation of the proposed drainage mitigation measures during the construction phase will ensure that no cumulative significant adverse impacts on the water environment will arise from the proposed development and any other wind farm development (including a concurrent construction of Cloghan wind farm) and non-wind farm developments within the River Shannon catchment.

In terms of cumulative hydrological effects arising from elements of the proposed development, no significant effects on water quality or flood flows are expected as they are all contained within the site and therefore will be within the wind farm drainage catchment where all construction water will be attenuated and treated.

Assessment

The main issues raised in the submissions relate to potential impacts on public water sources, impacts on water quality in rivers and potential impacts on public health. The applicant's response is contained in Appendix 2 of the further information response document.

Irish Water have concerns that the proposed development may impact on the Banagher public water supply. They also have concerns regarding impacts on Shannon River intake which lies 4.3 km downstream of the site.

As noted, the proposed development does not fall within the source protection area for the Banagher GWS. Most wells are well removed from the site and groundwater is less vulnerable to impacts from the development due to the shallow nature of the works, the dominance of moderate/low permeability of the subsoils and their depth above the aquifer. The greatest potential for impacts would arise from the construction phase with the potential for sediments, hydrocarbons etc to enter

groundwater. Subject to the mitigation measures proposed, which are designed to protect the water environment, no significant effects are likely to arise. It is not anticipated that construction would result in significant water level drawdown which would impacts on any wells in the vicinity of the site.

The EIAR outlines significant measures to protect surface water. There will no direct discharges to any watercourse during any phase of the development. The new drainage system will be integrated into the existing drainage system. Mitigation will be achieved by avoidance and design. A 50m buffer zone will be maintained from the main watercourses during construction and proven best practice methodologies will be employed to mitigation impacts on water quality during each phase of the development. New settlement ponds and silt traps are proposed which will provide an increased level of treatment and attenuation. Subject to the implementation of these measures and appropriate monitoring, I do not consider that the proposed development will impacts on water quality in adjacent water courses, including the River Shannon.

The issues raised by the DoHLG and IFI relate to elevated levels of ammonia in surface water samples taken from around the site, which exceeds the standard required to support 'Good' ecological status. I note that the elevated ammonia levels arise from decomposition of peat, which occurs naturally. Following the cessation of peat operations and less peat disturbance on the site, these levels would be expected to decline. Having regard to the limited footprint of the proposed development, combined with enhanced drainage proposals, incorporating additional treatment and attenuation, I do not consider that the proposed development is likely to result in significant effects which would compromise water quality in adjacent water courses.

With regard to the issues raised by IFI regarding the retention time in the proposed settlement ponds, the settlement ponds/silt traps which will be installed prior to construction will be maintained following construction. This will increase attenuation/treatment by retaining water within the bog for longer periods. Run-off calculations indicate that there will only be marginal increases in discharges and the enhanced treatment is likely to result in improved discharges from the site.

The applicant has confirmed in response to IFI's submission that weak shale rock would not be is used road construction which could potentially be crushed by machinery releasing fine sediment material into the drainage system with impacts on water quality. The applicant has confirmed that any water related road crossings works will be agreed in advance with IFI.

I consider that the applicant has responded adequately to the issues raised by the HSE which mainly revolve health and safety consideration for staff at the substation.

Conclusion

Significant best practice measures are proposed to cover all phases of the development to ensure surface water and ground water are adequately protected. I am satisfied that the impacts identified would be avoided, managed or mitigated by these measures and through suitable conditions. I am, therefore satisfied that the proposed development would not have any unacceptable direct, indirect or cumulative impact on surface or groundwater in the area. I consider that the information provided in the planning application documentation is sufficient to allow the impacts of the proposed development to be fully assessed.

9.10. **Air and Climate**

EIAR summary

The potential direct and indirect effects of the proposed development on air quality and climate from each phase of the development are considered in Chapter 10 of the EIAR. Appendix 10.1 contains details of carbon loss and savings calculations associated with the proposed windfarm.

Air

Due to the non-industrial nature of the proposed development and the general character of the surrounding environment, air sampling was not considered necessary for the EIAR. The site lies within Zone D of the Air Quality Zones for Ireland designated by the EPA, which represents rural areas located away from large population centres. The nearest air monitoring station is located in Ferbane c.9km from the site. The measurements at the station for sulphur dioxide, particulate matter, nitrogen dioxide and carbon monoxide dates back to 2006/2007 (Tables 10.3 -10.6).

Likely significant effects during construction stage/mitigation measures

The main emissions likely to be generated during the construction phase are identified as vehicle emissions and dust emissions.

Vehicle emissions – The construction stage will necessitate the operation of construction vehicles and plant on the site. This will occur during the construction of the various elements of the development, the junction bypass at Kennedy's Cross and with the transport of turbine components and construction materials to the site. The movement of vehicles and plant will result in exhaust and dust emissions with the potential to impact on air quality. However, the impacts will be localised to work locations and will be temporary in nature.

Standard mitigation measures will be employed to reduce the potential for exhaust emissions such as maintaining vehicles/plant in good operational order and switching off while not in use. Specific routes will be used for the transport of materials and turbine locations, which will be in agreement with the planning authority. Aggregate material will be sourced locally to minimise travel and reduce potential emissions. No significant effects are therefore predicted.

Dust emissions - The potential for negative impacts from dust emissions on off-site receptors would be limited due to the isolated nature of the site and the vegetative screening that exists around the site. There is potential for works at the junction of Kennedy's Cross and for the transport of turbines and materials to cause localised dust impacts. These will be temporary and short-term and are capable of effective mitigation.

The mitigation measures will include standard best practice, including dampening of haul routes, sporadic wetting of loose stone surfaces, maintaining excavations and stockpiles to a minimum and adherence to the measures set out in the CEMP which includes dust suppression measures. No significant effects on air quality are predicted during the construction stage of the development.

Likely significant effects during operational stage/mitigation measures

The only negative impacts likely to arise during the operational stage with the potential to impact on air quality are exhaust emissions associated with vehicle/machinery required for intermittent maintenance on the site. This impact will be mitigated by maintaining plant and machinery in good operating condition,

thereby minimising emissions that may arise. No significant effects on air quality are predicted from these operations.

There will be long term significant positive impacts on air quality associated with the provision of an alternative supply of electricity to that generated from coal and oil/gas fired power stations. This will result in a reduction of emissions of carbon dioxide, oxides of nitrogen and sulphur dioxide to air, which will also be positive in terms of impacts on human health. The impacts during the operational stage are therefore assessed as positive.

Likely significant effects during decommissioning stage/mitigation measures

The impacts associated with decommissioning will be similar to those associated with construction, but of reduced magnitude. Similar mitigation measures to reduce potential impacts would be implemented.

Climate

The EIAR refers to the connection between greenhouse gas emissions and climate change. The combustion of fossil fuels in energy use contributes significantly to these emissions. In order to reduce emissions and combat climate change there is a need to move away from reliance on coal, oil and other fossil fuel-driven power plants. The EIAR refers to Ireland's poor performance in achieving its targets both in terms of greenhouse gas emissions and renewable energy. Currently, it is proposed to achieve a renewable electricity target of 70% and a 30% reduction in green house gases by 2030. In order to achieve these targets it will be necessary to phase out coal and peat-fired electricity generation plants and increase renewable electricity. The proposed wind farm development will contribute towards the attainment of these targets.

Calculating carbon losses and saving from the proposed development

Peatland habitats are significant stores of carbon. The works associated with the development of a windfarm can either directly or indirectly allow the peat to dry out, which permits the release of stored carbon as CO_2. The EIAR refers to a methodology[9] developed by Bord na Mona to calculate the carbon losses and

[9] Informed by the Scottish Governments Carbon Calculator 2016 and other published information as documented in the EIAR.

savings from wind farm development. The methodology reflects the specific nature of the cutaway peat lands on which the windfarm would be located.

The model and its assumptions are detailed in Appendix 10.1 of the EIAR. The peat losses are based on the volume of peat disturbed and redistributed and takes a 'worst-case' approach, by assuming that the in-situ peat has been rewetted and therefore has zero net emissions, and the redistributed peat has high emissions associated with rush and birch/willow scrub habitat type. The model calculates the total carbon emissions associated with the proposed wind farm development including manufacturing of turbine technology, transport, construction and carbon losses due to peatland disturbance. The model calculates the carbon savings associated with the wind farm development against three comparators as detailed in the EIAR (Section 10.2.3.2)

The expected and maximum worst-case scenario CO_2 losses due to the proposed wind farm development are summarised in Table 10.9 and the total savings against the three comparators are summarised in Table 10.10. Based on the Bord Na Mona model calculations, the quantity of CO_2 that will be lost to the atmosphere due to changes in the peat environment, represents a fraction of the total amount of carbon dioxide emissions that will be offset by the proposed wind project (Table 10.9). The volume of CO_2 that will be lost to the atmosphere will be offset by the proposed development between 1 and 2 years of operation, depending on the fuel source to which it is compared.

Likely significant effects during construction stage/mitigation measures

The construction phase will require the operation of construction vehicles and plant on the site which will result in greenhouse gases being emitted to the atmosphere. The impact is assessed as a slight negative impact as the emissions will be low and over a temporary period. Standard mitigation measures will be employed including maintenance of vehicles/machinery, use of specific haul routes and use of locally sourced materials. No significant effects are predicted.

Likely significant effects during operational stage/mitigation measures

The proposal, which will generate energy from a renewable energy source, will offset energy and the associated emission of greenhouse gases from electricity generating stations dependent on fossil fuels, which will have a positive impact on climate. The

impact will be long term and positive. There will be emissions from plant/machinery involved in routine maintenance on the site, but these will not be significant.

Likely significant effects during decommissioning stage/mitigation

The impacts will be similar to those identified during construction, but will be of reduced magnitude. Similar mitigation measures will be implemented.

Conclusion

One of the observers considers that the reduction of CO_2 emissions is not a reality when all the factors concerning wind energy generated electricity is considered. I consider that the matter has been adequately addressed in the EIAR as set out above.

I consider that the information provided in the planning application documentation is sufficient to allow the impacts of the proposed development to be fully assessed. I am satisfied that the impacts identified on Air and Climate would be avoided, managed or mitigated by measures forming part of the proposed scheme and I am, therefore, satisfied that the proposed development would not have any unacceptable direct or indirect impacts on air quality or climate.

9.11. **Noise and Vibration**

The noise and vibration impacts associated with the proposed development are assessed in Chapter 11 of the EIAR. Cumulative impacts were also considered. This chapter is supported by Appendix 11.1 to 11.6 contained in Volume 3 of the EIAR. The applicant's response to further information addresses issues raised by the Board, the planning authority and observers.

EIAR summary

As part of the background assessment, 7 no. noise sensitive locations were identified to establish typical background noise levels. The EIAR describes the survey methodology, which was conducted in accordance with the guidance set out in the Institute of Acoustic's *'Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise* (IoA GPG, 2013). The background noise in the vicinity of the site was noted to be typical of any rural setting and background levels mostly determined by distance from the surrounding road

network. There was no perceptible source of vibration noted at any of the survey locations.

The derived daytime and night background noise levels are indicated in Table 11-11 The data presented indicates that background noise levels range during day time from 23 to 36 dB $L_{A90,10\ min}$ at low wind speeds increasing to up to 43 dB $L_{A90,10min}$ at higher wind speeds. Night-time levels ranged from 22 to 44 dB $L_{A90,10\ min}$.

The proposed operational limits in $L_{A90,10\ mins}$ for the proposed development set out in the EIAR are:

- 40 dB $L_{A90,10\ min}$ for quiet daytime environments of less than 30 dB $L_{A90,10min}$:
- 45 dB $L_{A90,10\ min}$ for daytime environments greater than 30 dB $L_{A90,\ 10\ mins}$ or a maximum increase of 5 dB above background noise (whichever is higher), and
- 43 dB $L_{A90,\ 10min}$ or a maximum increase of 5 dB above background noise (whichever is higher) for night time periods.

Likely significant effects during construction stage/mitigation measures

There is potential for the generation of significant levels of noise associated with various construction activities (site preparation, construction of turbine bases, assembly of turbines, construction of roads, substation and other works) and from construction traffic. There is also potential for vibration impacts.

Noise from construction works

The potential impacts of construction stage noise and vibration is assessed in accordance with best practice guidance as described in the EIAR. There is no statutory Irish guidance relating to the maximum permissible noise levels that can be generated by the construction phase of a development. Best practice guidelines are taken from BS5228-1:2009=A1:2014 *'Code of practice for noise and vibration control on construction and open sites-Noise'.*

Under this guidance NSL's are designated into a specific category (A, B or C) based on existing ambient noise levels in the absence of construction activity. This then sets a threshold noise value that, if exceeded, indicates a significant noise impact is associated with the construction activities (Table 11.1 of EIAR). Properties close to the development have daytime ambient noise levels that typically range from 40 to

50 $L_{Aeq,1hr}$ and have therefore been afforded a Category A designation. If the specific construction noise activity exceed the appropriate category value (e.g 65 dB $L_{Aeq,T}$ during daytime period) then a significant effect is deemed to have occurred.

The EIAR considers each element of construction (turbine and hardstand, substation/ a grid works and internal roads). Table 11.13 and Table 11.4 sets out details of plant items that will be used during the construction, typical noise emission levels, and the predicted noise level at the nearest NSL's.

All of the predicted noise levels associated with the construction are below the significance threshold of 65 dB $L_{Aeq,1\ hr}$, which removes the potential for significant adverse effects on sensitive receptors. Construction activity will not be static in any particular location but will move around to different locations within the site. This together with its temporary and short-term nature reduces the potential for annoyance and adverse impacts on sensitive receptors. Mitigation will be achieved by the application of noise limits, limiting the hours of operation and the implementation of typical best practice measures to reduce potential noise/vibration effects on the site. The impacts are assessed as negative, slight and short-term.

Noise from traffic

The potential noise impacts from construction related traffic along public roads and haul routes is assessed in accordance with the guidance set out in the Design Manual for Roads and Bridges (DMRB). The EIAR considers the increase in traffic that will be generated by each stage of construction (Table 11.15), using the information presented in Chapter 14 (Traffic & Transportation). The changes in traffic noise levels associated with the additional traffic has been calculated for several routes and this is presented in Table 11.6. The changes in traffic noise levels dB(A) are estimated to be within 0.1 and 2.4 dB, which in accordance with the guidance will not be in the order of magnitude that would generate significant effects (>3 dB). No mitigation is considered necessary.

Construction vibration

Vibration associated with construction has the potential to result in cosmetic/ structural damage to buildings and human discomfort. The EIAR documents the guidance relevant to acceptable vibration within buildings and permissible levels during construction. Due to the significant separation distance between sensitive

locations, no significant vibration effects associated with the construction phase are predicted and no specific mitigation measures are considered necessary. However, it is intended that vibration from construction activities will be limited to the recommended limits to avoid any potential impacts.

Likely significant effects during operational stage

The greatest potential for noise related impacts will occur during the operational stage. The EIAR considers noise levels associated with the proposed turbines, internal roads and the proposed substation.

The predicted noise levels for the proposed development have been calculated for all noise sensitive locations identified within a 2km radius of the proposed turbines. A worst-case omni-directional assessment has been completed assuming all noise are downwind of all turbines at the same time and noise predictions have been made using worst-case conditions favourable to noise propagation. The results indicate that the predicted noise levels associated with the proposed development in isolation would be well within the best practice noise criteria curves recommended in the Wind Energy Development Guidelines for Planning Authorities (2006). The worst case omnidirectional predicted noise levels from the operation of the Derrinlough turnines at any noise sensitive location are below 40 dB $L_{A90,10min}$ at wind speeds up to 7m/s. However, when taken in conjunction with existing/permitted turbines there is potential for cumulative exceedances of the noise criteria at 5 no. noise sensitive locations. Attenuation would, therefore, be required under certain wind speeds and directions in order to avoid cumulative turbine noise levels exceeding the turbine noise limit values.

There will be no significant operational noise impacts associated with the proposed substation or internal roads. Traffic on the internal roads during the operational stage will be minimal, associated with occasional windfarm maintenance. While the substation will operate 24 hours day, it is located c.300m from the nearest noise sensitive receptor and no significant noise issues are predicted offsite.

<u>EIAR conclusion</u>

The conclusion reached in the EIAR is that construction related impacts will be capable of effective mitigation and following the implementation of best practice measures, noise and vibration will not significantly impact on sensitive receptors.

During the operational stage, attenuation of the Derrinlough turbine noise emissions will be required under certain wind conditions to ensure that cumulative noise levels comply with best practice noise criteria. Mitigation will be achieved through the curtailment of turbines at various wind speeds and directions. Potential exceedance of noise limits will be experienced at 5 no NSL's (R114, R032, R058, R089 and R168)

Assessment

Many of the observers have raised issues regarding the potential for adverse impacts on their residential amenity associated with noise generated by the proposed development. It is stated that the existing 2006 Wind Energy Development Guidelines are out of date and cannot be relied on by the developer. I would note that the 2006 Wind Energy Guidelines continue to apply.

The planning authority requested clarification that consideration had been given to a planning application for 2 no. turbines proposed close to the windfarm. Details of the application were unknown at the time of the preparation of the original EIAR. The applicant's response to further information provided a revised assessment to include consideration of the additional turbines. However, I note in the interim that the development has recently been refused permission (ABP 307392) and is, therefore, no longer a consideration in this assessment.

While I accept that the applicant's proposal to confirm predicted noise exceedances at the commissioning stage raises concerns for the planning authority, I accept that compliance can only be measured effectively once the turbines are commissioned into use. The curtailment strategy is based on a desk top study with conservative noise prediction calculations and worst-case assumptions. I note that turbines can be programmed effectively to run in reduced noise modes to achieve the attenuation required. I consider that this is an issue which can effectively be resolved post construction and that curtailment measures can be implemented as required.

The planning authority consider that a cumulative night time limit of 40 dB should be imposed on the proposed wind farm. I accept the applicant's argument that this would be difficult to achieve when other developments in the area are permitted to operate at 43dB(A) or 5dB(A) above background noise. I also note that both the current and draft wind farm guidelines recommend a fixed limit of 43 dB(A).

I consider that the applicant' response adequately addresses the other issues raised by the planning authority and provides a reasonable justification why the background noise survey undertaken for the Meenwaun was not suitable for the Derrinlough assessment. I note that the applicant has updated information to ensure that clarity is provided in relation to dwelling ID's and the proximity to the nearest turbines. (Table 2 Appendix 1 of response).

The concerns raised by the observers relate to the location of the noise monitoring locations across the site and the predicted noise levels at dwellings close to the site. Other matters raised relate to the accuracy of modelling, use of the weighted dB(A) metric that only measures one part of the acoustic spectrum and that the assessment fails to take into account amplitude modulation, low frequency and infrasound. It is also contended that the noise environment has no capacity to accommodate the proposed development together with existing and permitted wind farms in the locality. These matters are considered in more detail below.

I accept that the EIAR and the response to further information provide a reasonable justification for the selection of the noise monitoring locations. I consider that these locations characterise the existing noise environment and provide a reasonable representation of typical noise levels across the study area.

With regard to impacts on residential property, the EIAR provides a comprehensive assessment of predicted noise levels from the wind turbines on all noise sensitive locations within a minimum radius of 2km of the proposed turbines. It indicates that attenuation of wind turbines will be required at a small number of properties under certain wind conditions both during day time and nigh time. Subject to the implementation of the curtailment strategy no significant effects on receptors are predicted.

With regard to cumulative impacts, it has been demonstrated that the noise environment has the capacity to accommodate the proposed windfarm in conjunction with existing and permitted wind farms in the locality subject to the attenuation of a small number of turbines. I accept therefore that the potential for cumulative impacts has been adequately assessed.

The response to further information responds to the submission made by Galetech Energy Services who raise concerns that the cumulative noise will exceed the 43 dB

noise limit pertaining to the adjoining Cloghan windfarm (established by Condition No. 11 of ABP 244054). An assumption was made that two landowner properties were subject to a 45 dB threshold limit. The revised assessment (Appendix 1) shows that some additional curtailment will be required at the two properties (R032 & R058) as a result of the lower threshold of 43 dB L_{A90}.

I have no reason to doubt accuracy of the noise modelling conducted as part of the EIAR which follows best practice and has been conducted by competent experts. I would also note that the A-weighted decibel is the most commonly used for measuring noise and conforms with the response of the human ear.

I am satisfied from the information provided in the EIAR and the response to further information that the observers concerns regarding infrasound and low frequency noise are unfounded. There is reference to published documents from various agencies including the EPA, WHO, UK Health protection Agency etc which fail to find an association between infrasound and health effects. I refer the Board to the Guidance Note on Noise Assessment of Wind Turbine Operations at EPA Licensed Sites (NG3), published by the EPA in 2011. It states that while the aerodynamic noise associated with wind turbines is broadband in nature and spread across the audible frequency range, there is a common misconception that there is a significant component of low frequency noise which is not the case.

I note that these issues are not referenced in the current Wind Energy Guidelines, but the draft Guidelines state (Section 3.3) that there is no evidence that wind turbines generate perceptible infrasound and that downward designs which had a propensity to generate low frequency noise components along with significant amplitude modulation. Downwind designs are no longer used for large onshore wind farms.

Regarding amplitude modulation (AM), the EIAR also refers to research in the field which suggests that amplitude modulation is a rare and unlikely occurrence at operational wind farms. I note that research in the area is ongoing and that it is not possible to predict an occurrence of AM at planning stage. Where it does occur, it is stated to be typically intermittent and can be monitored and appropriately mitigated. No significant effects are therefore likely to arise.

Conclusion

I consider that the issues raised by the observers have been comprehensively addressed. I consider that the noise assessment which represents a worst case scenario is robust and identifies all of the potential impacts associated with the construction and operational stages of the development and considers cumulative effects. I accept that subject to the mitigation measures outlined in the EIAR that noise associated with the development is not likely to result in significant effects on sensitive receptors and no significant vibration effects are predicted which would impact on nearby receptors.

9.12. **Landscape and Visual Impacts**

EIAR summary

Chapter 12 of the EIAR provides an assessment of the likely significant effects of the proposed wind farm on the landscape and visual amenities of the area. It describes the methodology and the guidance used to undertake the assessment. A 20km study area is adopted for the Landscape and Visual Impact Assessment (LVIA) for

landscape and visual effects, and 15km from the proposed wind turbines for effects on landscape character. The assessment includes visibility mapping, representative viewpoints and photomontages.

The following appendices are relevant:

- Appendix 12.1: Landscape and Visual Impact Assessment Methodology
- Appendix 12.2: Landscape Character Assessment Tables
- Appendix 12.3: Assessment of Photomontages
- Appendix 12.4: ZTV Map

Volume 2 of the EIAR contains the Photomontages.

The EIAR includes a landscape assessment and a visual assessment. As the study area extends into areas of Co. Galway and Co. Tipperary, landscape character areas /designations/policies for these counties are also considered.

Landscape assessment

The EIAR establishes the baseline environment and identifies key landscape receptors following consideration of landscape designations, the landscape character areas within the study area and the landscape character of the development site.

Landscape designations

The eastern part of the site (Drinagh Bog) falls within the Lough Boora Parklands which is designated as a 'High Amenity Area' in the current Offaly County Council Development Plan. These areas which are classed as of 'High Landscape Sensitivity' are described as having *"extremely low capacity to absorb new development"*.

The western part of the site (Clongawny Bog) is classified as of 'Moderate Landscape Sensitivity'. These areas are described as "*Generally 'open' in character with intrinsic quality and moderate capacity to absorb new development".* It is stated (Table 7.11.3) that *'some of the cutaway bogs may be appropriate for other sensitively designed and located developments including renewable energy (windfarm, biomass crops) and/or industrial use'.*

It is an objective of the Plan (AHAO-1) to protect and preserve the county's primary areas of high amenity, which includes Lough Boora Parklands.

There are 2 no. scenic routes identified in the county (Map 17.9) and both lie within the LVIA study area. The closest runs to the north along the R357 between Blue Ball and Shannon Bridge. The other route lies to the south along the R440 and R421 (Birr to Kinitty and Ballard to Kinitty). The objective of the Plan (LAP-03) is to protect these amenity routes from insensitive levels of roadside development and excessive levels of development.

There are a number of views of special amenity value/special interest which are protected in the Plan (Table 7.11.5 and Map 7.18). It is an objective of the Plan (LAO-02) to preserve these views which will be assessed on a case-by case basis as part of the development management process. Those which occur within the study area are identified in Fig 12.8 of the EIAR.

There is one Primary Amenity Area (Fig 12.1) associated with Lough Derg and its environs within the part of Co. Tipperary that falls within the study area. This area is c 14.3 km from the nearest turbine and based on this distance, the ZTV mapping, local topography and vegetation, it is considered highly unlikely that any of the turbines will be visible from this area. There is one scenic view (View 54) within the study area, which is orientated away from the site.

Within Co Galway, all areas within the study area are assessed as of 'Low' landscape value with the exception of a narrow corridor along the River Shannon which is classed as 'Medium' value. Two focal points (from which views of high scenic quality are possible) fall within the 20km study area as shown in Fig 12.8 of the EIAR. These are 17km from the nearest turbine and focussed away from the proposed development.

The EIAR (Table 12.1) lists all identified high amenity areas within the study area. From an analysis of the ZTV and actual visibility of the development from these areas, with the exception of Lough Boora Parklands, it is not anticipated that there will be actual visibility from the other high amenity areas within the study area.

Landscape Character Areas within the study area

Landscape Character Area (LCA's) were identified within the study area from the Landscape Character Assessments contained in the development plans for Co. Galway and Co. Offaly. One has not been published for Co. Offaly and accordingly a provisional landscape character assessment was carried out by MKO Planning and Environmental Consultants for the purposes of the landscape and visual impact assessment. The development site falls with the area identified as 'Central Wetlands' (Fig 12.7).

Zone of Theoretical Visibility (ZTV) mapping was used to indicate where turbines would theoretically be visible from the LCA's within the LVIA at distances ranging up to 5km, 5-10km and 10-15km. This enabled screening out of landscape receptors that would not, or, would only be marginally impacted by the proposed development. For the remaining landscape receptors, potential visibility was assessed on site and this enabled other landscapes receptors to be excluded on the basis of screening/partial screening.

Landscape character of the site

The landscape character of the site is considered to fall within a ‘flat peatland’ character type as described in the Wind Energy Guidelines. The landscape value of the site is assessed as ‘Low’ and the landscape sensitivity as ‘Low’ to ‘Moderate’ due to its degraded nature from past peat harvesting.

It was concluded from this part of the assessment that a number of landscape receptors including Lough Boora Parklands high amenity area, three LCA’s in Co Offaly, one LCA in Co Galway and the landscape of the proposed development site warranted full assessment.

Visual Assessment

Key visual receptors were identified based on designated scenic routes and scenic views, settlements, recreational and tourist destinations, OSi viewing points and transport routes. The visual receptors are listed in Tables 12.7 to 12.14 of the EIAR and their locations together with theoretical visibility is indicated in Fig 12.8. From the preliminary assessment those visual receptors that showed no theoretical visibility were eliminated (Table 12.16). Designated views and viewpoints shown on the OSi maps that are not directed towards the proposed development were also eliminated for further consideration (Table 12.6). Other views were screened out due to screening (Table 12.17). The remaining visual receptors were selected as viewpoints due to their significance within the study area and the potential visual effects they may experience due to the proposed development.

Additional viewpoints were also selected within 5km of the site to assess the visual effects closer to the proposed development from various directions (Viewpoint VP12 and VP15) and VP14 was selected to provide an assessment of the visual effects within Co Galway. Despite the ZTV map showing widespread visibility in Co Tipperary, no locations with both clear visibility of the proposed development and significant visual receptors could be found.

EIAR conclusion

In terms of landscape and visual effects, the impacts associated with construction are assessed as short term, slight to imperceptible and negative. The construction stage of the development is expected to last between 24-30 months. This stage of the development will involve temporary construction compounds, the construction of

site roads, electricity substation and on-site grid connection as well as the movement of construction and turbine transport vehicles into and out of the site.

It is acknowledged that the operational stage of the development has the potential to result in landscape and visual effects. The only landscape receptor likely to experience landscape effects is Lough Boora Parklands Area of High Amenity. While the area has currently sparse and generally low vegetation, it is being allowed to regenerate which will make a greater contribution in screening the proposed turbines.

It is accepted that the landscape character of the site will undergo change by the introduction of vertical structures into an otherwise flat landscape. In terms of effects on landscape character it is concluded that the greatest landscape effects ('moderate') would be experienced in the provisional LCA for Co Offaly 'Central Wetlands' where the turbines will be located. These potential effects would be mitigated by partial, intermittent and generally reduced visibility of the project due to its design and the character of the site and its surrounds. Moderate effects are also predicted to Co. Offaly Provisional LCA 'Slieve Bloom Mountains Upland Area' arising from the sensitivity of the landscape receptor and not as a result of changes to the landscape character. The cumulative landscape effects are assessed as 'Moderate in the 'Central Wetlands' and Low in other LCA's which were brought forward for assessment.

The assessment of visual effects concludes that significant visibility of the site is limited to relatively short distances. This is due to the flat nature of the site and its surrounds, the presence of screening in the form of mature hedgerows, treelines and commercial forestry and the wide expanse of the site and separation distance to visual receptors.

The significance of visual effect was not considered to be 'Profound', 'Very Significant' or 'Significant' in any of the viewpoints considered. A residual effect of 'Moderate' was considered to arise at 3 locations (VP3, VP11, VP12). In all other cases the visual effect was assessed as 'Slight' or 'Not Significant'

The landscape and visual effects during decommissioning are anticipated to be similar to those arising during the construction stage.

Assessment

I inspected the site and its surrounding from the surrounding road network and have had regard to the relevant chapters of the EIAR and the supporting appendices. I have visited the viewpoint locations and examined the photomontages submitted, which I consider are sufficiently representative of views in the area and adequate for the purposes of the assessment. I also had regard to the concerns raised by the observers including those raised by the planning authority.

The main issues raised by the observers relate to the visual impact of the proposed development on the landscape and visual amenities of the area, and the potential cumulative impacts when taken in conjunction with other windfarms. Concerns have been raised regarding turbine design, the quality of the photomontages and it is asserted that there are inconsistencies in the landscape assessment.

In terms of impacts on the landscape character, I accept that the site corresponds and contains the key characteristics of a 'Flat peatland' character area as defined in the current Wind Energy Guidelines. These landscapes are recognised as having significant potential for wind energy development and have the capacity to accommodate large scale proposals with large spatial extent. I accept that the proposed development adheres to the guidance provided for such landscape types in terms of location (turbines are located away from roadsides) spacing (regular) layout (clustered grid), height (tall turbines on an even profile). The Guidelines cautions against cumulative impacts in conjunction with other windfarms which would result in crowding and dominance in the flat landscape, which is considered in more detail below.

In terms of the landscape sensitivity, the eastern part of the site (Drinagh) is located within an area designated 'High Amenity Area', which is stated in the Plan to have limited capacity to absorb development. However, under the Wind Energy Strategy (WES) this designated area incorporates areas identified as suitable for wind energy development (including Lough Boora). In contrast, the western bog (Clongawny) is not considered to have the same sensitivity, incorporates areas which are not considered suitable for wind energy development.

There appears to be a level of conflict in the development plan between the recognition of cutaway bogs as being suitable for wind energy development and the designation of these sites as area of high amenity. In this context I would draw the

attention of the Board to Fig 3 of the WES which includes areas of the proposed development site (which are designated high amenity) and are marked as 'Cutaway Peat' and which are described as

'areas generally having visually degraded landscape character, very low levels of residential settlement and large landholdings which give then a high potential for the development of windfarms-while avoiding conflicts with neighbours or scenery'.

Table 1 of the WES the 'Area south of Cloghan' which incorporates the site is listed as one of the main areas having wind energy development potential and is deemed suitable for *'large scale wind farms'* due to it having '*low levels of adjacent dwellings, reasonable access to grid, proximity to access and areas of cut-over bog'.*

While part of the site is located within an Area of High Scenic Amenity, from my observations of the site and its surrounds, it is difficult to determine what landscape sensitivities are present (with the exception of Lough Boora) which warrants the lands at Drinagh Bog being afforded a higher level of sensitivity than Clongawny to the west.

Regarding the assessment of the visual impact on the proposed development, the applicant produced a series of photomontages and wireframes from 16 no. viewpoints. The photomontages aid in the assessment of potential impacts from the key visual receptors identified in the EIAR (Table 12.8). The location of the photomontages are shown in Fig 12.9 of the EIAR. The viewpoint locations were influenced by ZTV mapping as an indication of areas that will have theoretical visibility and from site visits. The ZTV shows theoretical visibility being greatest closest to the site with pockets of no visibility increasing in size and frequency with distance from the site. Most the photomontages are therefore from within 5km of the site.

An additional 3 no. photomontages/wireframes were submitted in response to further information. The photomontage booklets were also amended so that images were displayed on one side only (Volume 2a and 2b (amended)). The photomontages also include the revised turbine height of 169m for the Cloghan wind farm, permitted under Reg Ref No 19/404 (subsequent appeal was withdrawn (307266).

The visual effects of the proposed turbines were assessed from each viewpoint in terms of the sensitivity of the visual receptors along with the magnitude of change as

recommended in the GLVIA guidelines[10]. The EIAR considers potential impacts from designated scenic views/routes, settlements, recreational and tourist destinations, recreational routes and transport routes. These are considered below.

Designated scenic views

A total of 5 no. views of special amenity value/special interest V10, V11, V12, V16 and V17 were brought forward for assessment out of 18 no. views identified within the study area. As noted, some of the views were screened out due to 'no visibility' as indicated by ZVI mapping. Others were excluded as the focus of the view was directed away from the proposed development, or that no views towards the proposed turbines could be established during the site visit.

Scenic View V10: represented by VP3 is located along a stretch of local road to the west side of Ferbane town. The view is along the road rather than from any specific point. The protected view is southwards towards the Slieve Boom Mountains, which are located to the left in the photomontage (120-angle view). The mountains are barely discernible in the view. Views along the road are intermittent and are constrained by ribbon development and roadside hedgerows/treelines.

The proposed turbines will be located at the back of Cloghan Hill and in a location where existing views are interrupted by existing low-level housing and existing vegetaion. Taking in conjunction with the existing Meenwaun and the proposed Cloghan windfarm, the proposed development will increase the spatial extent of the turbines, but will not result in additional significant impacts on views of the Slieve Bloom mountains.

Having regard to the significant distance involved (T21 at a distance of 7.28km), the partial screening provided by topography, buildings and vegetation, the orientation of the protected view towards the south and the precedent created by existing development including existing/proposed windfarms, I consider that the proposed development can be accommodated without causing significant adverse effects on the designated view or the visual amenities of the area.

Scenic View V11: represented by VP4 is located along the regional road (R357) to the north of the site which is also a designated amenity route. The protected view is

[10] Guidelines for Landscape and Visual Impact Assessment, Landscape Institute/Institute of Environmental Management and Assessment, UK, 2013.

southwards towards the Slieve Bloom mountains. Views across the landscape are constrained by building and vegetative screening. No turbines will be visible from this location.

Scenic View 12: represented by VP2 is located along a local road (L-07009 Stonestown) immediately north of the site. The view is along the road rather than from any specific point. The view is from the local road southwards over boglands towards the Slieve Bloom mountains, which are barely discernible (to the left) in the 120-angle view. The nearest turbine is T21 at a distance of 1.27km. Existing views along the road over the bogland are significantly constrained by existing buildings and roadside hedgerows/treelines. This is one of the viewpoints where the residual visual effect is assessed as 'Moderate' in the EIAR.

The viewpoint selected by the applicant occurs at a gap in roadside vegetation along the section of the road with the highest elevation. There are limited viewing opportunities and this is the only section of the road where open views are available. The view is over a degraded peat landscape, in a location where the bog is close to the road.

The proposed development will introduce large vertical elements into an otherwise flat landscape, altering its character and the visual amenities of the area. While the sensitivity of the area would be regarded as 'High' due to the designation of the view, it is within an area designated suitable for wind farm development and there is a precedent established by the permitted Cloghan wind farm. The proposed turbines will increase the spatial extent of the existing/permitted turbines in the view, which together with the permitted Cloghan Windfarm will become the dominant feature in the view.

The local road is not part of a designated scenic road or a marked walking route and there are no viewing points/pull in areas. It is difficult to appreciate the view given its limited visibility. The Slieve Bloom mountains, towards which the view is protected, are not clearly identifiable in this view due to the significant distance involved.

I accept that the proposed development would constitute a significant additional contribution resulting in a greater cumulative impact which will impact on the character of the scenic view. However, having regard to the precedent established

by the permitted Cloghan windfarm, I do not consider the proposal is of a magnitude to warrant a refusal of permission.

Scenic View V16: represented by VP9 is located to the south west of the windfarm and south of Kinnity village. The nearest turbine is T5, located at a distance of 14.5km. The view is from an elevated position providing expansive views over rural countryside. The protected views are 'westward over farmland'.

The development will be visible in the distance but will not appear incongruous. It will marginally increase the spatial extent of the existing/permitted turbines as viewed from this location. Taken together with existing/proposed turbines, I accept the cumulative effect will not dominate or seriously detract from the scenic view or the overall character of the area.

Scenic View V17: represented by VP6 is located to the south east of the site and Kilcormac village. The nearest turbine T15 at a distance of 10km. The view is from an elevated position providing long range views over rural countryside. The protected view is 'to the north east and north west over lowlands'.

The proposed windfarm will bridge the gap between the existing Meenwaun and proposed Cloghan wind farm and will not increase the overall visual spatial extent of the turbines. While the sensitivity is high due to the designation of the view and the turbines will be visible in long range views, I do not consider that the proposed development either alone, or, cumulatively with other existing/proposed wind farms will significantly impact on the protected view.

The planning authority considers that the turbines outside the designated area (T3, T5, T8, T13,T14,T15 andT16) should be omitted and this would significantly improve the visual spatial extent of the turbines particularly from VP3, VP4, VP5, VP10 and VP12 alleviating some of the concerns regarding cumulative impacts. I accept as set out in the assessment of each of the photomontages, that there are locations where the proposed development, taken in conjunction with existing/proposed wind farm development will increase the spatial extent of the turbines. I do not consider that the removal of the turbines identified by the planning authority will significantly reduce the cumulative effects from the viewpoints, which are largely mitigated by distance, the low level of residential receptors and the lack of defined sensitivities.

One of the observers refers to the visual impact of T7, T8 and T9 from the residential property located along the regional road (R438) in Timolin. At this point the nearest turbines are at a distance of c1km. While there are sections of the road that the turbines will be visible, views along the road are largely interrupted by roadside screening. The proposed turbines would be more visible in the view that the permitted Cloghan turbines, however, only the upper portions will be visible from the houses due to existing vegetation (VP18), which mitigates to some extent the visual impact of the turbines.

Scenic amenity routes

There are 2 no. scenic amenity routes to the north and south of the site, which were also assessed for visual effects.

Northern Scenic Amenity Route: represented by VP4 (east) and VP16 (west). The designated scenic route is between Blueball and Shannonbridge and skirts close to the northern section of the site. Significant views towards the windfarm are interrupted by roadside building and vegetation. No significant impacts are therefore anticipated either alone, or, in combination with existing/permitted windfarms developments.

Southern Scenic Amenity Route: Due to screening by roadside vegetation the only location where a clear view of the proposed turbines could be confirmed was at VP7, on the most elevated section of the Scenic Amenity Route. The route runs between Birr and Kinnity and is located a significant distance from the site. The nearest turbine is T15 at a distance of 13.57km.

The view from VP7 is over open rural countryside. The proposed development will fill the gap between the existing Meenwaun and proposed Cloghan wind farms and will result in a very marginal increase in the overall spatial extent of the existing/proposed turbines in the landscape. The existing development will be visible in the distance and when taken together with existing/proposed turbines, it is not considered that the cumulative effect will in any way dominate or seriously detract from the scenic route.

Settlements

From the assessment of the settlements within the study area, the two towns identified as visual receptors and selected as viewpoints were Banagher and Ferbane.

Viewpoint V13 represents the view from Banagher looking east. The closest turbine is T10 at 3.75km. Two of the proposed turbines will be visible in the view in conjunction with two of the Meenaun turbines. The remaining turbines are screened from view by the existing built infrastructure and vegetation.

The proposed development will not alter the spatial extent of the turbines or significantly alter the view from this location. The proposed development either alone or cumulatively with other existing/proposed wind farms will not significantly impact on the view.

Viewpoint VP3 represents the view from Ferbane. The impacts from this viewpoint are assessed above. No significant effects on views from the town are predicted.

Recreational and Tourist Destinations

The EIAR identifies a number of recreational and tourist destinations within the study area including Birr Castle, Lough Boora Discovery Park and Clonmacnoise. The ZTV indicated that there would be no visibility from Birr Castle and the site assessment confirmed there would be no visibility from Clonmacnoise. Therefore, Lough Boora Discovery Park is the only area likely to be impacted by the development.

Lough Boora Discovery Park lies to the east of the proposed development and VP4 and VP 5 are the selected viewpoints. As noted above VP4 is located on the Regional Road to the north of the site and there will no be impacts in views from this location. VP5 is located on the western edge of the discovery park and while the upper portions of some the proposed turbines will be visible, the development will not dominate or significant impact on views from this location.

Recreational Routes

The only walking/recreational routes within the study area identified with the potential to be impacted by the development including the Offaly Way and Lough Boora Walking Trail. These are assessed from viewpoints VP4 and VP5, which are assessed above and it is concluded no significant visual impacts will arise.

Transport Routes

The visual impact of the development from the N62 is assessed from VP1 and VP10. In the view from VP1 towards the south east, the turbines will appear as lower elements behind the permitted Cloghan development and will not increase the spatial extent of the turbines. To the south-west the turbines will be visible primarily in conjunction with the Meenwaun wind farm. The new turbines will be forward and closer to the national road and will be more dominant in the view. In the views from VP10 to the north along the N62, the turbines will be visible at different points along the road. The extent of visibility will not curtailed to a degree due to the screening afforded by existing vegetation.

I accept that the proposed development will result in noticeable changes in the character of the landscape without affecting its sensitivities. Taken in conjunction with existing/proposed windfarm development, the distances to the site and the screening afforded by existing vegetation, I do not consider that significant profound effects will arise.

Other Viewpoints

In addition to the visual receptors identified, additional viewpoints were selected within 5km to assess the visual effects closer to the site and from within Co Galway. These include VP11, VP12, VP14 and VP15. Additional photomontages were also submitted in response to further information (VP17, VP18 and VP19).

VP 11 is from the N62 south of the existing entrance to Derrinlough Briquette Factory and the visual impact of the proposed development to the east and west is assessed. It is one of the three viewpoints where the residual visual effect is assessed as ‘Moderate’ in the EIAR. The landscape is flat and dominated by trees and hedgerows which close off views. At present the only visible turbines visible are the 4 no. associated with the Meenwaun site to the west. Construction has not yet started on the Cloghan windfarm to the east (9 no. turbines). The proposed development will be forward and closer to the N62 than the Meenwaun cluster to the west and will be behind the proposed Cloghan development and further away from the N62 to the east.

The proposed development will increase the spatial extent of turbines in the landscape and create cumulative visual impacts. However, I consider that the landscape, which does not contain any particular sensitivities has the capacity to

accommodate the development. Mitigation will be achieved by mature trees and hedgerows and by distance which ranges from 1 km to the west to 1.5km to the east. There are some residential properties fronting onto the N62 in this location but views will be restricted to an extent by screening to the rear of the properties.

VP12 is also one of the viewpoints where the residual visual effect is assessed as 'Moderate' in the EIAR. The view from the R438 to the south west of the site. The closest turbine is T4 at 5 km. The Meenaun wind farm is visible within a linear and orderly arrangement. The proposed Cloghan wind farm will be positioned to the rear of the existing turbines and will not increase the spatial extent established by the Meenaun turbines. All of the turbines associated with the proposed development will be visible in this view resulting in a significant change in the landscape. It development will increase the spatial extent of wind turbines and result in a more visually cluttered arrangement. The impact will be mitigated to some extent by distance and the low number of residential receptors in the vicinity.

VP14 is from the R356 to the west of the site and C 2km east of Eyrecourt in Co Galway. The nearest turbine is T10 at 11.4km. Two of the turbines associated with the Meewaun windfarm are visible in the distance. Views towards the site are restricted by existing vegetation and an elevated ridge. The proposed development will not increase the spatial extent of the turbines formed by the existing Meenwaun and proposed Cloghan development. Having regard to the separation distance and the screening afforded by landform and vegetation, I do not consider that the proposed development will significantly alter the character of the landscape or the visual amenities of the area.

VP15 is from a local road to the north west of the site and c 2.4 km from the nearest turbine. Some of the turbines will be visible in conjunction with the existing (Meenwaun) and proposed turbines (Cloghan). The spatial extent of the turbines does not increase as a result of the proposed development. The landscape in this location is already impacted by electricity infrastructure and while some of the turbines will be visible, the impact will not be significant and will be mitigated by treelines and vegetative screening.

VP17 is from the local road to the south of the site (L3006). The Meenaun turbines are concealed in the view by existing buildings and screening. The Cloghan

windfarms will be visible as a cluster and the proposed windfarm will increase the overall spatial extent of turbines in the landscape. While the proposed development will alter the landscape character and the visual amenities of the area, views along the local road are intermittent due to buildings and road side vegetation. Further west along the road there are open views of the existing Meenwaun turbines and the proposed development will be visible in these views.

VP18 is located to the west of the site from the Regional Road. The closest turbine is T7 at 1km. The view is over agricultural land with a backdrop of vegetative screening. The Meenaun turbines are not visible from this location. In a 'do-nothing' scenario some of the Cloghan turbines will be visible above the treeline. The proposed Derrinlough wind farm will be more prominent in the view and will increase the overall spatial extent of the turbines in the landscape. The landscape does not contain features which are particularly sensitive and taken in conjunction with the permitted Cloghan windfarm will not result in significant adverse effects on the visual amenities of the area.

VP19 (a and b) is from Drinagh townland which comprises an elevated area to the east with residential development on each side of the local road. The closest turbine is less than 1km from the photomontage location which is along a trackway to an uninhabited house that is substantially screened. The photomontage indicates that the proposed turbines will be visible in the view with impacts on the character and visual amenities of the area. Taken in conjunction with existing and permitted development there is potential for significant cumulative impacts. However, I note this route is not designated and there is substantial intermittent tall screening provided by hedgerows on both sides of the road facing the proposed turbines which mitigates potential impacts on residential receptors.

Turbine design

The planning authority raised issues regarding the turbine design and requested the Board consider the ratio of rotor diameter to hub height, stating that a ratio in the order of 1:1 gives rise to the typical tall slender and proportional appearance of the turbines. When the rotor diameter significantly exceeds the hub height, this can result in a dominant and chunky structure with potential visual impacts and order and legibility when taken in conjunction with permitted developments.

In the response to further information, the applicant provided details of the turbine dimensions for existing/permitted turbines in the locality and the rotor diameter to hub height (Table 2). It shows that the recently permitted optimised Cloghan turbines (19/40 - appeal withdrawn ABP 307226) has the same ratios as that of the proposed development (1.3:1) and that the other adjacent Meenwaun wind turbines also have a ratio above 1:1. The applicant further notes that the hub height of the Meenaun and Cloghan are 100m and 109m respectively and that to achieve a ratio of 1:1 at a tip height of 185m would result in a hub height of 123m (compared to 110m as proposed) which would give rise to greater cumulative visual impacts.

As part of the Landscape and Visual Impact Assessment, the applicant assessed whether different turbine designs may give rise to visual effects. Viewpoint 12 was chosen for this exercise as the existing Meenwaun and proposed Cloghan turbines are clearly visible in the view. The alternative photomontage prepared for Viewpoint 12 which is contained in the photomontage booklet shows that using an alternative design would have an imperceptible visual impact.

Galetech Energy Services raised concerns regarding inconsistencies in the landscape assessment. It is stated that it was completed on the basis of the permitted Cloghan Wind Farm (PL19.244053) which permitted turbines up to 150m in height. However, cumulative effects were assessed on proposed amendments to the original permission for turbine heights of 169m, which gives rise to confusion and ambiguity.

I would point out to the Board that when the application was made to the Board, Offaly Co Council had issued a decision to grant permission for the amendments under Reg Ref No 19/404. A subsequent appeal was withdrawn (ABP 307266). It has been clarified in the further information response that the photomontages submitted consider the revised turbine height of 169m (identified as permitted wind farm -subject to appeal) for the Cloghan Wind Farm. I do not therefore consider that there are any outstanding matters in this regard.

Other elements of the development

The proposed electricity substation and compound would be located on a flat area of ground to the north east of the site. It would be well set back from the road network and screened from residential properties to the west. Two alternatives are identified

for the proposed grid connection, consisting of an overhead line, or an underground cabling option. The overground line would involve the installation of 6 No. new lattice towers which would be located within the proposed development site. Clearly this option would have a greater visual impact than the underground cable, but I note that the that the final decision on the grid connection will be decided by ESB/EirGrid.

While I accept that the proposed development will introduce a large infrastructural element onto the site, the site appears to be located outside the 'high amenity area' and boundary vegetation will assist in the assimilation of the development into its surroundings.

Conclusion on landscape and visual assessment

Notwithstanding the designation of a portion of the site as an area of high amenity, having regard to the landscape character of the subject site, comprising a large flat peatland site with long established commercial peat milling operations, I consider that the proposed development can be accommodated without resulting in significant adverse effects on the landscape character and sensitivities of the area. I consider that the applicant has comprehensively demonstrated that there will be no significant effects on the wider Lough Boora Parklands Area of High Amenity arising from the proposed development.

While the proposed development will introduce tall structures into the landscape, the site is relatively flat which limits the potential for open views over long distances. I accept that views will be pronounced from some locations and that most of the visual impacts will occur within close proximity of the site. However, the route screening assessment undertaken in the EIAR (Figure 12.10) shows that the majority of the the roads within 5km of the site have partial/intermittent screening, which mitigates effects.

In terms of the key visual receptors identified in the EIAR, I accept that the proposed development will not result in significant adverse effects on views from designated amenity routes, settlements, recreational/tourist destinations, recreational routes or transport routes.

In terms of protected views, the greatest impact will be from V12, represented by VP2 in the photomontages. While the proposed development will alter the view, I note the precedent established by the permitted Cloghan windfarm, the very limited

potential for views from the local road over the bogland and the mitigation provided by roadside vegetation.

I accept that there is increased potential for cumulative visual impacts from the R438 to the south west (VP12) the L3006 to the south (VP 17) from Drinagh to the west (VP19), and from the N62 in the vicinity of the site. I accept that the impacts are mitigated by low number of sensitive receptors, the lack of defined sensitivities and separation distances.

I consider that the applicant has provided a comprehensive assessment of the landscape and visual impacts of the proposed development on the landscape and visual amenities of the area. I consider that the information provided in the planning application documentation is sufficient to allow the impacts of the proposed development to be fully assessed. I am satisfied that the proposed development would not give rise to any significant additional adverse visual impacts on scenic views, scenic routes, settlements, recreational/tourist destinations or transport routes.

9.13. **Archaeology & Cultural Heritage**

EIAR summary

Chapter 13 of the EIAR assesses the potential direct and indirect effects of the proposed development on the archaeological, architectural and cultural heritage landscape. This chapter is supported by Appendix 13.1 (Photographic Record of Proposed Development) and Appendix 13.2 (Licensed Archaeological Monitoring Report)

Information on the existing environment was obtained from desk-top and field surveys. The desk top study included a review of online map viewers, data bases topographical files and records to establish baseline conditions. Field investigations were carried out in November/December 2019 and January 2020. Appendix 13.1 contains a photographic record of the site.

There are no UNESCO World Heritage Sites in the study area but Clonmacnoise, which is situated c 15km to the north-west is included on the Tentative List. A total of 4 no. National Monuments were identified within 10km of the nearest turbine the closest at c 5km. Viewshed analysis which represents a worst case scenario

indicates that there are no instances where the full length of the turbines would be visible from any of these monuments. However, there are instances where the upper portions could be visible.

There are 28 no. Recorded Monuments within the site boundary, some of which are recorded as 'redundant'. The monuments that exist are classified as 'toghers'.[11] The locations of the recorded monuments are shown on Figure 13.8 to Fig 13.11. They are located generally to the south and west of T11 and to the east of T15 and are described in the EIAR. The walkover surveys of the site conducted in preparation of the EIAR, indicates that no surfaces traces of these monuments were visible. None of the turbines or associated infrastructure will be located on, or, in close proximity to these monuments. To the west of the location of the proposed junction modifications at Kennedy's Cross there are 2 no. recorded monuments. These are located c.150m from the proposed haul road.

With regard to architectural heritage, there are no protected structures within the proposed development site. The majority of structures which are included on the Record of Protected Structures for Co. Offaly are concentrated within the settlements of Banagher and Cloghan. Details of the protected structures within 5km of the nearest turbines are set out in Table 13.7 and Figure 13.21. The EIAR also provides details of structures included in the National Inventory of Architectural Heritage within 5km of the nearest proposed turbine (Table 13.8 and Fig 13.22). No new sites of cultural heritage significance either of regional or national importance were recorded during the walkover survey.

There is a memorial plaque considered to be of local importance on the proposed internal road which extends from T21 as far as the substation. Post construction this roadway will be used as an amenity walkway.

Likely significant effects during construction stage/mitigation measures

The EIAR assesses each element of the development in terms of potential impacts on the archaeological, architectural and cultural heritage resource.

There is no potential for any direct impacts arising from the development on any national monuments in State Care/Ownership. There are no recorded monuments

[11] 'Toghers' are peatland trackways constructed of wood which may date from the Neolithic to the medieval period

within the footprint of any part of the development with the potential to be impacted by construction. Whilst recorded monuments are identified within the site, mitigation is achieved by avoidance.

One section of the amenity pathway will be located in the south-east corner of Drinagh bog and there is a large cluster of recorded monuments to the south of the amenity trail. However, the nearest monuments are noted to be redundant records. The pathways will be floated on the peat and accordingly no impacts on known archaeological features is likely to occur. There will be no direct impacts on the know archaeological resource from the amenity carpark and pathways and no mitigation is deemed necessary.

However, as noted in the EIAR, the presence of recorded monuments within the bog and the stray finds uncovered, is an indication that the bog is an area of high archaeological potential. The potential exists for the development area to contain as yet unrecorded sub-surface sites and artefacts. Significant negative and permanent impacts could arise during construction associated with excavation and groundworks. To mitigate potential impacts standard measures are proposed including pre-development testing and construction stage monitoring. Sites/features if detected during testing and/or monitoring will be preserved by record or preserved in-situ.

With regard to indirect effects, these would only come into play once the development is constructed. The visual impact on features are therefore considered to be operational effects. No indirect effects were identified that would occur during the construction stage.

Regarding the architectural resource, there are no structures of architectural importance within the site with the potential to be impacted by the construction stage of the development. No mitigation measures are required. The memorial plaque which is identified as of local cultural heritage will be fenced off during construction. Following the implementation of the mitigation measures the residual impact will be imperceptible.

Likely significant effects during operational stage/mitigation measures

Once the development is completed there is potential for indirect effects to occur including impacts on the setting of features of archaeological, architectural and

cultural heritage. The assessment of impacts on the visual setting was undertaken using the Zone of Theoretical Visibility (ZTV) map in the Landscape and Visual Impact Assessment of the EIAR (Chapter 11). Viewshed analysis was used in the assessment of potential impacts on the visual setting of cultural heritage assets in the wider landscape (10km and 20km).

Clonmacnoise is included on the World Heritage Sites tentative list. It is situated c. 15km to the north-west of the proposed development. The ZTV conducted as part of the Landscape and Visual Impact Assessment (Fig 11.1) and the viewshed analysis from the south side of the Clonmacnoise graveyard in the direction of the proposed development, up to a 20km radius from the monument, indicates that there are potentially no instances where any component of the turbines would be visible from the monument.

With regard to impacts on National Monuments in State Care, the viewshed analysis indicates that there are no instances where the full length of the turbines would be visible from any of the monuments. Potentially 10-15 of the turbines could be seen from mid-shaft upwards with a larger number of the upper portions of turbines visible from these monuments. However, the viewshed analysis results represent a worst-case scenario as the model does not take natural screening, buildings or boundaries into considerations. The overall impact is assessed to be ‘slight’ to ‘not significant’. It is not possible to mitigate these impacts.

The site investigations revealed that there were no visible traces of the recorded monuments within the study boundary. Any monuments recorded on, or, near the surface in the original 1997 assessment survey have not survived. As these monuments do not have any visual extent in the landscape there is no potential for impacts on their setting.

There is a plethora of recorded monuments within 5km of the site and the ZTV shows that potentially all turbines (half blade) may be visible from the areas within the 5km zone. As already noted, the ZTV does not take into account natural screening boundaries and buildings and is, therefore, a worst-case scenario. However, given the flat topography of the surrounding landscape, it is likely that there will be some visibility in the direction of the turbines. The majority of the

monuments are noted to be inaccessible to the public, being on private lands. The overall impact is assessed ‘slight’ to ‘moderate’.

The closest monument to the electricity substation and grid connection (overground) consists of a Holy Well, located c 1km from Turbine 2. No impacts on its setting are likely as no part of the well is visible above ground level. There is also a monument (listed as an enclosure) located c 10.6km to the west, which has no above ground expression.

Regarding architectural heritage, the majority of the protected buildings/structures are associated with the settlements of Banagher and Cloghan. There may be visibility of the turbines from some of the protected structures in the wider locality. There will be no direct effects and no impacts on the immediate setting or curtilage of these buildings/structures and accordingly the significance of impacts is assessed as ‘Slight’ to ‘Moderate’

Cloghan is located c 3km to the north-west of the proposed substation building. The visual setting of the protected buildings/structures does not extend beyond the village limits and will not be negatively impacted by this element of the development.

Cumulative Impacts

The EIAR assesses the cumulative impact of the proposed development on archaeology, architecture and cultural heritage in combination with other wind farms within 20km of the site. It also assesses the cumulative impacts associated with extraction of stone from quarries as no burrow pits are proposed on the site.

There is no potential for cumulative direct impacts on any monuments or architectural heritage structures as there none located within the site of the proposed development or within the footprint of other projects. Subject to the mitigation measures proposed there will no cumulative direct impacts on unknown subsurface sites. Nine existing quarries have been considered to provide material for the proposed wind farm development. These quarries are all existing and operational and accordingly the archaeological and cultural heritage potential of the continuation of quarrying activity is likely to be low.

In terms of cumulative indirect impacts associated with the operational stage, the viewshed analysis indicates that no additional turbines would be seen from Clonmacnoise and no cumulative indirect impacts will occur. The viewshed analysis

run for national monuments within 10km of the site (worst-case scenario) indicates that more turbines will be visible and the effects on setting for some of the monuments will increase e.g. from ‘slight’ to ‘slight/moderate’.

Due to the lack of expression above ground level of recorded monuments within the site, cumulative impacts are not likely. Taken in combination with other existing/proposed windfarms in the area, it is likely that more turbines will be seen in the wider landscape which will marginally increase impacts on the setting of recorded monuments within 5km of the site. There will be similar cumulative indirect impacts for protected buildings/structures within 5km of the site.

The decommissioning stage will not give rise to significant impacts on the archaeological, architectural or cultural heritage resource of the area as any potential direct impacts will already have been resolved through mitigation measures during the construction stage.

Conclusion

Subject to these mitigation measures proposed, I accept that significant impacts on the archaeological, architectural and cultural resource of the area are not likely to arise. I note that the DoHLG have recommended a condition requiring archaeological monitoring of all groundworks which is standard to ensure protection of potential unrecorded remains.

I consider that the information provided in the planning application documentation is sufficient to allow the impacts of the proposed development to be fully assessed. I am satisfied that the impacts identified on archaeology, architecture and cultural heritage would be avoided, managed or mitigated by measures forming part of the proposed scheme. I am, therefore, satisfied that the proposed development would not have any unacceptable direct, indirect or cumulative impacts on the archaeological, architectural or cultural heritage of the area.

9.14. **Material Assets**

EIAR summary

Chapter 14 of the EIAR assesses the likely significant effects of the proposed development on transportation infrastructure and on telecommunications and aviation. This chapter should be read in conjunction with Appendix 14.1.

The bogs are intersected by the N62 which travels north-south connecting to the N52 to the south at Kennedy's Cross. The N52 connects Birr to the south with Tullamore to the north east and beyond to the M6 motorway at Kilbeggan. The R357 travels to the north of the site, the R438 to the west and the R437 to the east. There is a network of local roads in the vicinity of the site.

The main transport route for abnormal loads is identified as via the M6, the N52 to Tullamore and towards Birr before turning northwards to the site on the N62 (Fig 14.1). The delivery route for general HGV construction traffic may vary depending on the location of quarries and the suppliers used for stone and other materials. Based on the location of quarries in the vicinity of the site and that deliveries of stone will be the majority of deliveries to/from the site, the route will comprise primarily the N62 to and from the north/south and the N52 to and from Birr and Tullamore. It is expected that smaller component parts for the windfarm will travel via Tullamore and the N52, and the N62.

Three entrances are proposed for the construction stage. All are existing Bord na Mona machinery entrances. The main entrances would be located off the N62 and will provide access east and west into the respective bogs. These entrances will facilitate the delivery of materials as well as large components including turbines blades and other sections. Upgrade works will be required at these entrances and the upgraded sections will be fenced off following construction but may be reopened during the lifetime of the wind farm, if abnormal loads are required to access the site.

The access off the R357 will be used only for the delivery of materials and components for the construction of the substation and grid connection works. This entrance will be upgraded following construction and will be used to provide permanent access to a proposed amenity car park. In addition, the existing machinery pass off the L7009 Local Road will be upgraded to provide permanent access to the proposed substation and local access to the proposed amenity pathway during the operational stage.

Information on background traffic volumes on the local road network was obtained from a continuous traffic counter maintained by TII on the N52 between Tullamore and Birr. Peak period classified turning count surveys were undertaken at the junction of the N52/N62 (Kennedy's Cross) to the north of Birr (locations 1, 2 and 3

shown in Figure 14.2b). A short-term PM peak hour count was also undertaken on the R357 (location 4 in Figure 14.2b). Base year 2019 traffic volumes for the four link locations shown in Figure 14.2b range from 2,264 vehicles per day on the R357 to 7,935 on the N52 between Kennedy's Cross and Birr. There were 2,864 vehicles per day on the section of the N62 leading to the site (Table 14.1). The busiest route is the N52 north of Birr, followed by the N52 from Tullamore.

Using TII annual growth rate data for the county it is forecast (assuming a medium growth rate) that background traffic volumes will increase by 3.6% during the period from 2019 (the observed traffic count year) to 2022 (the assumed construction year). Forecast background traffic volumes for all vehicles in 2022 are shown in Table 14.5.

Using the TII traffic count data recorded on the N52 and the peak period traffic count undertaken on the N62, the percentage of HGV's was observed to be in the order of 7% on both the N52 and the N62 approaching the site.

Likely significant effects during construction stage/mitigation measures

The assessment of the effects of traffic generated by the proposed development is considered in two stages in the EIAR. Stage 1 involves the movement of vehicles associated with site preparation and ground works and Stage 2 is associated with the delivery of turbine components. It is estimated that 43,510 two-way trips will be made to the site by trucks and articulated HGV's during all of Stage 1(Table 14.6). The 21-day period associated with concrete pouring will add an additional 360 two-way PCU's to the network per day. The other 489 days during which materials will be delivered to the site will add an additional 412 PCU's to the network per day.

During the turbine construction stage (Stage 2) there will be a total of 189 trips by extended articulated lorries resulting in 100 two-way PCU's/day on two days/night per week over a 19-week period. A further 84 trips will be made by conventional large articulated HGV's resulting in an additional 14 PCU's being added to the network (2 days per week over an 11-week period associated with the delivery of other equipment.

It is estimated that a maximum of 100-120 staff members will be employed on the site at any one time during Stage 1 reducing down to 80 staff during Stage 2. In a worst-case scenario, where it is assumed that all staff will travel to/from the site by car, a total of 120pcu movements would be added to the network during the

groundworks stage, reducing to 80 pcu trips during the turbine construction stage. It is expected that deliveries of materials will take place during the day after staff have arrived and before they leave at the end of the day.

The EIAR provides an assessment of the effects of development related traffic on the local road network during construction. Typical construction day scenarios are set out in Table 14.12 to Table 14.15. The percentage increase in traffic volumes associated with each stage is detailed in Table 14.16 to Table 14.19. There will be increases in traffic volumes on the local road network associated with each stage of construction.

During Stage 1 and the 21 days when the concrete foundations are poured there will be an increase in traffic levels ranging from 5.3% on the N52 in the direction of Birr to 14% on the N62 leading to the site. During the remaining 489 days for the site preparation and ground works, when deliveries to the site will take place, traffic levels will increase from 5.9% on the N52 to/from Birr, to 11.5% on the N62 and 20.6% on the R357 approaching the site.

During Stage 2, turbine construction will take place involving the delivery of large equipment using extended articulated lorries. Additional traffic will appear on the road network for 38 days with volumes increasing by 3.0% on the N52 from the direction of Tullamore and by 5.3% on the N62 approaching the site. These movements are likely to result in the most significant traffic impacts due to the speed, size and geometric requirements of the vehicles. During the turbine construction stage there will also be other deliveries involving conventional articulated trucks resulting in an increase of 1.6% on the N52 in the direction of Tullamore and 2.8% on the N62 approaching the site.

The EIAR assesses the capacity of the road links and junctions to accommodate the construction traffic generated by the development. Background, or do nothing flows, are compared to flows forecast for the various construction delivery stages (Table 14.21) and the percentage reached for each link and stage is shown in Table 14.22. The most heavily impacted link will be the N52 in the direction of Birr with the link capacity forecast to operate at 78% for the do-nothing scenario, increasing to a maximum of 82% during the 21 days that the concreate foundations will be poured. The N62 in the vicinity of the site is forecast to operate well within capacity for all

scenarios, increasing from 40% for the do-nothing scenario to a maximum of 46% on the 21 days that the foundations will be poured.

The increases in traffic will have a negative impact on the local road network, but the effect will be temporary and is assessed as slight, with the exception of traffic associated with the transport of turbine components where the impact is assessed as moderate due to the size of the vehicles involved. The construction of the N62 underpass will result in traffic delays, but the effect will be temporary lasting 20 days.

An assessment of the capacity of the N52/N62 junction was undertaken using PICADY software. While other junctions along the network will experience increased traffic volumes, the N52/N62 is identified as the most affected. During peak hours and during the peak construction period up to 120 workers will pass through the junction. It is expected that deliveries will take place during the day and will not occur at the same time. The results of the capacity assessment show that additional car trips passing through the junction will increase the maximum ratio of flow to capacity (RFC) at the junction from 0.8% to 6.5% in the AM peak and from 33.2% to 46% during the PM peak hour, which is within the acceptable limit of 85%.

The greatest potential effect that will be experienced on the road network is identified in the EIAR as the transport of large loads (blades, tower sections and nacelles) which will take place over approximately 38 days. This is a specialised operation involving very long vehicles with specific turning requirements. The impact on the local road network will be minimised by transporting these abnormally sized large loads at night.

The optimum transport route for abnormal loads is identified as via the M6, the N52 to Tullamore and towards Birr before turning northwards to the site on the N62. A geometric assessment of the delivery route and its capacity to accommodate the abnormal sized loads associated with the development was undertaken as part of the assessment. The route and assessment locations are shown in Fig 14.2a. A preliminary swept path analysis using Autotrack was carried out to establish the location where the transport vehicles could be accommodated and where remedial works may be required. Details of each location and the works required are set out in Appendix 14.1 of the EIAR.

At 9 no. locations works would be required to roundabouts, levelling and surfacing works to centre island, road widening at approaches, removal of signs etc. At 2 no. locations (Location 10 - N52 Kilcormac east and Location 11 - Kilcormac west) parking restrictions would be required to allow the vehicles to negotiate these locations. At Kennedy's Cross (Location 12), the swept path analysis is based on the delivery route bypassing the existing junction to the east and the provision of a new roadway.

Upgrade works, proposed junction layouts and visibility plays would also be required at the 2 no. site access locations off the N62 to accommodate large vehicles. These are presented in Figures 14.6 to 14.17. These are designed to accommodate all wind farm vehicles. Similarly, the access to the north off the R357 (Figure 14.14 to 14.21) will be capable of safely accommodating all of the vehicles associated with substation traffic.

In terms of mitigation it is recognised that the completion of the development will require significant coordination from a traffic perspective. The delivery of abnormal sized loads in particular will require advance planning and will take place in consultation with Offaly Co. Council and An Garda Siochana. In accordance with established practice these convoys will take place at night when traffic is lightest. It is estimated that 189 abnormal sized loads comprising 38 convoys of 5, will be undertaken over 38 separate nights. The nights will be spread out over a period of 19 weeks (2 nights/week) and will be agreed in advance. The convoys will be managed with police and escort vehicles to minimise impacts on traffic movement and safety.

In terms of mitigating traffic effects, a detailed Traffic Management Plan (TMP), will be prepared providing details of traffic management prior to commencement of construction. It will be agreed with Offaly Co Council and An Garda Siochana and will form part of the CEMP. The TMP will include the appointment of a competent traffic management co-ordinator for the duration of the works. It will include a delivery programme in advance of delivery of turbine components to ensure that deliveries are scheduled to minimise the demand on the local road network and pressure on the access to the site. It shall be submitted in advance to Offaly Co Council and following liaison with relevant local authorities and the TII. It will include protocols to keep local residents informed in advance of upcoming traffic related

matters such as temporary lane/road closures where required, or delivery of turbine components at night. The TMP will also contains details of any pre-and post construction survey of roads required by the local authority and details of re-instatement works.

Likely significant effects during operational stage/mitigation measures

During the operational stage of the development, the wind farm will be unmanned except for occasional traffic associated with maintenance, typically two trips per day by maintenance staff. The impact will be neutral.

The site will also attract visitors for amenity purposes, which will access the site via the R357 at the location of the proposed amenity car park. Based on information from other Bord Na Mona facilities, it is anticipated that numbers are likely to be small, with a maximum of 40 car trips per day. Having regard to the capacity of the local road network, it is not anticipated that this will give rise to significant effects.

Due to the very low traffic levels that will be associated with the operational stage of the development, no mitigation measures are considered necessary.

Likely significant effects during decommission stage/mitigation measures

The design life of the proposed wind farm is 30 years. Decommissioning would involve the tower and equipment being disassembled and removed off site. It is intended that the turbine foundations and hardstanding areas would be left in place and covered with soil/topsoil. It is also proposed to leave the access tracks in-situ. If removal was deemed necessary, mitigation measures similar to those for the construction stage would be implemented.

In the event that the proposed development is decommissioned, a decommissioning plan will be prepared and agreed with the local authority. The plan will include similar mitigation measures to those implemented during the construction stage.

Potential cumulative effects

Table 14.24 details the projects which have the potential to result in cumulative effects with the proposed development in terms of traffic impacts. It is noted that the delivery routes for the Cloghan and Meenwaun Wind Farms are similar to that proposed for this wind farm (N52/N62). If the proposed development is constructed at the same time as either of these windfarms, there would be a temporary and

moderate level of cumulative impact. This would be avoided by ensuring that the construction phase for all three developments do not overlap through scheduling of deliveries and with agreement of Offaly County Council.

Telecommunications and Aviation

It is recognised in the EIAR that wind turbines have the potential to interfere with broadcast signals by acting as a physical barrier or causing a degree of scattering to microwave links. The most significant effect occurs where the wind farm is directly in line with the transmitter radio path.

As part of the initial scoping exercise the applicant consulted with national and regional broadcasters, fixed and mobile telephone operators, aviation authorities, ComReg and other relevant consultees. Details of responses received are detailed in Table 14.25 of the EIAR. Response from broadcasters indicated no potential for interference to television and radio reception due to the operation of the windfarm. Some of the telephone, broadband and other telecommunications operators identified potential interference risks. These were addressed and requested buffers were incorporated into the final design.

The potential for electromagnetic interference from wind turbines will only occur during the operational stage. Mitigation will be achieved by design and no turbines will be located within the areas requested to be left clear of turbines. In accordance with standard practice a Protocol Document will be signed by the developer, which ensures that in the event of any interference to radio or television reception due to the operation of the wind farm, that required measures will be undertaken to rectify this. Subject to these measures, there will be no significant adverse direct or indirect effects on telecommunications from the proposed development. Subject to the requirements of the Irish Aviation Authority (IAA) no significant impacts on aviation will occur.

With regard to cumulative impacts, it has been established that the proposed development will not result in direct or indirect impacts on telecommunications and aviation and accordingly there is no potential for it to act in combination with other windfarms to create cumulative effects.

Issues raised during the course of the application

The main issues raised relating to the impacts of the development on the road network were from Transport Infrastructure Ireland (TII). A response prepared by Alan Lipscombe is contained in Appendix 3 of the applicant's response. Issues were also raised by Galetech Energy Services, regarding the underpass proposal and the potential for cumulative traffic considerations should construction of the Cloghan and Derrinlough windfarm occur concurrently. The IAA require matters relating to potential impacts on aviation to be addressed.

TII refers to official policy which seeks to avoid the creation of access points onto the national road network, or the intensifications of existing access points, outside of 50km/h urban zones. As part of the proposal it is proposed to upgrade the existing access point to the site from the adjoining N62. The proposed development will result in significant increases in traffic which will result in the intensification of the use of the access. Following construction, it is the intention of the applicant that the upgraded section of the junction would be fenced and would only be brought back into use should abnormal loads be required to access the site.

TII have no objection to the temporary use of the access points but have concerns relating to the potential for intensification of use should the access be reopened in the future. While I understand the concerns raised by TII, both access points currently exist. Subject to the upgraded area being fenced off, I do not consider that significant issues arise. I consider that this matter can be successfully addressed by condition, if considered appropriate by the Board.

TII note that planning permission (19/404) has been granted for another windfarm which includes improvements on the national N52/N62 junction to cater for turbine delivery/abnormal loads. The Board will note that this application related to amendments to a previously approved permission (Reg Ref 14/188 & ABP 244053) for 9 no. turbines to the north of the proposed development (Cloghan windfarm). The improvements propose a temporary widening of the N52/N62 junction at Kennedy's Cross to facilitate turning of abnormal loads. In order to accommodate oversized deliveries, the current proposal is to by-pass the N5/N6 junction by the creation of a roadway to the north of the junction. The TII have raised no objection to the new

road during the construction stage but have concerns regarding the applicant proposal retain the gates in situ following completion of construction.

Whilst I accept that it would be beneficial if a co-ordinated approach to junction improvements could be facilitated, I do not consider that the Board can rely on the temporary improvements proposed at Kennedy's Cross junction. Should the Cloghan development not proceed, the junction improvements would not be available and there is no information to hand to indicate that improvements would be adequate to accommodate the oversized vehicles associated with the proposed development.

Following construction, it is applicant's intention to cover the access track with top soil and reseed it. The gates would be retained to facilitate any requirement for an oversized delivery for wind turbine maintenance to be accommodated in the future, which would not appear unreasonable, given the lack of alternatives. The gates would otherwise be permanently locked and the access would not be used for any other purpose. Subject to a condition requiring that any future use of the access road be agreed in advance with the planning authority and the TII, I have no objection to this arrangement.

TII are of the opinion that certain interventions to the national road network should have been addressed prior to a decision being made on the application, so that any recommendations arising could be incorporated as part of the planning conditions. These include Road Safety Audits in relation to the works impacting on the national road network and the design of the underpass and associated barriers.

The applicant has indicated in the response that all stages of the Road Safety Audit process will be completed prior to construction in accordance with TII guidance. Similarly, it is proposed to obtain Technical Acceptance from TII for the detailed design of the proposed underpass in accordance with TII requirements. While I accept that it would be preferable if these matters were resolved prior to any decision, I consider that they can be adequately addressed by planning conditions, should the Board be minded to grant permission for the development.

With regard to the identified haul routes which are the responsibility of numerous local authorities, private maintenance and PPP companies, TII requires the applicant to consult with the relevant authorities and private companies with respect to all works that affect roads/junctions on the national road network and that all works be

undertaken in accordance with current standards and subjected to Road Safety Audits. It requires that all relevant approvals, consents, agreements and licences should be in place prior to construction.

The applicant has committed to fully engage with the various local authorities and other relevant parties with respect to works that affect roads and junctions on the national road network and to implement all the mitigation measures set out in Section 14.1.10.6 of the EIAR. I note from a perusal of other windfarms permitted by the Board, that it is not standard practice to attach conditions requiring the applicant to engage with such authorities/private companies etc.

It is contended by Galetech Energy Services that the proposed underpass would have a significantly greater impact on the safety, capacity and operational efficiency of the N62 than an underground cable (proposed to be partly located with the N62) which was refused permission by the planning authority. I note that this decision was subsequently overturned by the Board (ABP 304056). The Board concluded that matters relating to construction/ reinstatement methodology could be agreed and addressed by condition and that the proposal would not cause adverse impacts on the capacity and efficiency of the National Road.

The construction of the underpass will cause disturbance and possible annoyance to those who use the N62. However, I note it will take 4 weeks to construct, will impact on c.150m of road and that a stop/go traffic management system will be operational. Having regard to the temporary and short-term nature of the works, I do not consider that the construction of the underpass will on its own, or, cumulatively with other traffic generated by the development result in significant effects on the capacity and efficiency of the national road.

With regard to the potential for cumulative impacts raised by Galetech should the construction of other wind farms occur in tandem with the Derrinlough wind farm, the applicant has identified (Table 14.24) the projects considered with the potential for cumulative traffic effects. The greatest potential for effects would arise if the Cloghan and Derrinlough proposals were constructed at the same time. I accept that this would contribute additional abnormal loads, HGV and other traffic onto the road network. The applicant states that traffic flows will be ‘medium’ and that a ‘Moderate’ cumulative effect will occur which can best be avoided by ensuring that the

construction phases do not overlap through careful scheduling of deliveries to each site and with agreement of Offaly Co. Council. I consider that this matter can be addressed by condition.

In response to matters raised by the Irish Aviation Authority, the applicant's response includes a report prepared by Cyrrus Aviation Consultancy (Appendix 5). It concludes that the windfarm will not impact on the flight calibration requirements for the Woftrap DME. The proposed development will not, therefore, impact on aircraft safety in the area.

A further submission made by the IAA on March 4th states that the applicant should engage with the Birr Airfield to ascertain whether this development will impact on the safety of aircraft operations at the aerodrome. I draw the attention of the Board to the standard type conditions normally imposed in respect of this type of development.

Conclusion

The potential for significant impacts from traffic will only occur during the construction stage. The N52/N62 and the regional road to the north (R 357) are the main routes that will be affected. It has been demonstrated that these roads have the capacity to accommodate the increased flows and that affected junctions will continue to operate within capacity. The impacts will be temporary and following completion of the construction stage, traffic volumes will revert to normal levels.

While I accept that the increases in traffic, the potential restrictions relating to lane/road closures and the transport of abnormal sized loads on the road network may cause inconvenience and a degree of annoyance to local residents and those using the road network on a regular basis, these impacts will be temporary and relatively short lived. I accept that the impacts will be reduced by the mitigation measures outlined above, which are standard for this type of development.

I accept that there is potential for cumulative traffic effects should the construction phase of the development occur concurrently with other windfarm development proposals in the area. I consider that this can be mitigated by phasing of deliveries in agreement with the planning authorities.

I accept that it would be preferrable that the matters raised by TII relating to Road Safety Audits and technical acceptance of the underpass were addressed as part of

the application, I consider that the issues can be adequately addressed by conditions.

I consider that the information provided in the planning application documentation is sufficient to allow the impacts of the proposed development to be fully assessed. I am satisfied that the impacts identified on material assets would be avoided, managed or mitigated by measures forming part of the proposed scheme and by relevant conditions. I am, therefore, satisfied that the proposed development would not have any unacceptable direct, indirect or cumulative impacts on material assets of the area.

9.15. **Interaction of Effects**

Interactions between the various environmental factors are discussed in Chapter 15 of the EIAR. A matrix is provided in Table 15.1 which outlines potential interactions during the construction and operational phases.

The main potential for interactions which would give rise to negative effects on population and human health arise from effects to water, air/climate, noise/vibration, landscape/visual impacts and material assets.

With regard to biodiversity, the main potential interactions which would give rise to negative effects arise from land/soils/geology, water, air/climate, noise/vibration and landscape.

Regarding ornithology, the main effects which would give rise to negative effects would arise from water, air/climate and noise/vibration.

The main potential interactions for land, soil and geology which would give rise to negative effects arise from water and archaeology,/architectural/cultural heritage.

With regard to air and climate, the main interactions likely to occur which would give rise to negative effects arise are from material assets (movement of construction vehicles around the site resulting in dust nuisance effects).

Regarding Landscape and Visual, the proposed development has the potential to change the landscape setting of recorded sites/monuments in the wider area and therefore have long term negative effects on archaeological, architectural and cultural heritage.

All of the potential impacts on the individual environmental factors have been assessed and I am satisfied that any such impacts can be avoided, managed and mitigated by the measures which form part of the proposed development and recommended planning conditions.

10.0 Appropriate Assessment

The Habitats Directive deals with the Conservation of Natural Habitats and of Wild Fauna and Flora throughout the European Union. Article 6(3) of this Directive requires that any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. The competent authority must be satisfied that the proposal will not adversely affect the integrity of the European site.

The proposed development is not directly connected to, or necessary to the management of any European site, and therefore is subject to the provisions of Article 6(3) and Part XAB of the Planning and Development Act, 2000, as amended.

Stage 1 – Screening for Appropriate Assessment

The first test of Article 6(3) is to establish if the proposed development could result in likely significant effects to a European site. This is considered Stage 1 of the appropriate assessment process i.e. screening. The screening stage is intended to be a preliminary examination. If the possibility of significant effects cannot be excluded on the basis of objective information, without extensive investigation or the application of mitigation, a plan or project should be considered to have a likely significant effect and Appropriate Assessment carried out.

The applicant carried out an appropriate assessment screening exercise, which is contained in Appendix 1 of the Natura Impact Statement (NIS). All European sites within 15km from the proposed development were considered (Fig 3.1), in addition to sites outside the zone where potential pathways are likely to exist. The screening report identifies all sites (27 no.) within the Likely Zone of Impact of the proposed development, their conservation objectives and their Qualifying Interests. These are listed in Table 3.1 of the report and include 19 no. SAC's and 8 no SPA's:

With respect to the majority of the sites (22 no.), it is concluded in the AA Screening Report that there is no potential for direct/indirect impacts arising from the proposed works. This arises as some of the sites (16 no.) are located in a hydrological catchment upstream of the proposed development or in a separate hydrological catchment. While there is hydrological connectivity between the development site and All Saints Bog and Esker SAC (Site code: 000566) via tributaries that drain into the Rapemills River, there is no connectivity with any of the habitats of qualifying interest. None of the habitats border the river and all of the habitats drain into the river and are at a significantly higher elevation than the river.

In the case of the SPA's, the potential for effects is eliminated on 3 no. sites on the basis that the site is located outside the potential foraging range of SCI species (Slieve Bloom Mountains SPA, River Suck Callows SPA, and Mongan Bog SPA). The site is outside the core foraging range region of Hen Harrier for which the Slieve Bloom Mountains SPA is designated. While the proposed development would be located within the core foraging distance for Greenland White-fronted Goose (5-8km) for which 2 no. sites are designated (All Saints Bog SPA and Dovegrove Callows SPA), the species was not recorded during extensive site surveys and the potential for significant effects was therefore eliminated.

With regard to the remaining 5 no. designated sites, the site is located outside the boundaries of the SAC/SPA's but is hydrologically connected with River Shannon Callows SAC, the Lough Derg North-east Shore SAC and Middle Shannon Callows SPA. It is also within the core foraging distance for SCI species associated with the Middle Shannon Callows SPA, River Little Bosna Callows SPA and there is hydrological connectivity between the site and Lough Derg (Shannon) SPA.

Based on my examination of the NIS report and supporting information, the NPWS website, aerial and satellite imagery, the scale of the proposed development and likely effects, separation distance and functional relationship between the proposed works and the European sites, their conservation objectives and taken in conjunction with my assessment of the subject site and the surrounding area, I would conclude that a Stage 2 Appropriate Assessment is required for 5 no. of the European sites referred to above as the possibility for significant effects cannot be ruled out. The remaining 22 no. sites can be screened out from further assessment.

Conclusion – Stage I Screening Report

It is therefore reasonable to conclude that on the basis of the information on the file, which I consider adequate in order to issue a screening determination, that the proposed development, individually or in combination with other plans or projects would not be likely to have a significant effect on European Site No(s) 000566, 000919, 000581, 000575, 002353, 000641, 002147, 002236, 000585, 000576, 000859, 002207, 000580, 001776, 000412, 000647, 000572, 004103, 004137, 004160, 004097 and 004017 in view of the site(s) conservation objectives and Appropriate Assessment is not therefore required for these sites.

No measures designed or intended to avoid or reduce any harmful effects on a European Site have been relied upon in this screening exercise.

The AA Screening report concluded that it is not possible to rule out the potential for significant effects on the following 5 no. European sites:

1. River Shannon Callows SAC
2. Lough Derg, North-east Shore SAC
3. Middle Shannon Callows SPA
4. River Little Brosna Callows SPA, and
5. Lough Derg (Shannon) SPA.

The Natura Impact Statement

The application was accompanied by an NIS which described the proposed development, the project site and the surrounding area. The NIS outlined the methodology used for assessing potential impacts on the habitats and species within the European Sites that have the potential to be affected by the proposed development. It predicted the potential impacts for these sites and their conservation objectives, it suggested mitigation measures, assessed in-combination effects with other plans and projects and it identified any residual effects on the European sites and their conservation objectives.

The NIS was informed by the following studies, surveys and consultations:

- A desk top study.
- Multidisciplinary walkover surveys at various dates during 2018/19.

- Standard habitat classifications within/adjoining works area (Fossit, 2000)
- Botanical surveys, targeted otter surveys and aquatic surveys.
- Bird surveys including vantage point surveys, breeding bird surveys, winter transect/waterfowl surveys and migratory bird surveys. (October 2017 - September 2019)
- Review of EPA's water quality data and WFD status for adjacent rivers.
- Consultation and review of NPWS site synopsis and conservation objectives for relevant European sites
- Consultations with An Taisce, Bat Conservation Ireland, BirdWatch Ireland, Irish Wildlife Trust, Department of Culture, Heritage and the Gaeltacht, Geological Survey of Ireland, Inland Fisheries Ireland and the Irish Peatland Conservation Council.

Having reviewed the NIS and the supporting documentation, I am satisfied that it provides adequate information in respect of the baseline conditions, clearly identifes the potential impacts, and uses best scientific information and knowledge. Details of mitigation measures are provided in Section 6 of the NIS. I am satisfied that the information is sufficient to allow for appropriate assessment of the proposed development (see further analysis below).

Appropriate Assessment of implications of the proposed development

The screening assessment concluded that potential pathways for significant effects existed between the proposed development and 5 no. designated sites and that further assessment was required in respect of the River Shannon Callows SAC, Lough Derg, North-east Shore SAC, Middle Shannon Callows SPA, River Little Brosna Callows SPA and Lough Derg (Shannon) SPA. The potential for significant effects could arise from hydrological connectivity resulting in indirect effects on habitats/species of conservation interest arising from a deterioration of water quality due to run-off of silt, hydrocarbons, cementitious material and other pollutants during construction, operation and decommissioning. Disturbance and displacement as a result of construction and collision risk associated with the operation of the turbines could also pose a significant risk to species of conservation interests in the SPA's. I concur with the conclusions reached in the screening assessment.

The following is an objective scientific assessment of the implications of the project on the relevant conservation objectives of the European sites using the best scientific knowledge in the field. All aspects of the project which could result in significant effects are assessed and mitigation measures designed to avoid or reduce any adverse effects are examined and assessed.

Relevant European sites

Details of the 5 no. sites brought forward for Appropriate Assessment together with their Qualifying Interests and the distance from the development site are set out below. A description of these sites and their Conservation Objectives and Qualifying Interests/Special Conservation Interests, including relevant attributes and targets for these sites are set out in Table 3.1 of the Screening Assessment (Appendix 1 of NIS).

Site Name	Qualifying Interests/Special Conservation Interests	Distance
River Shannon Callows SAC (Site code: **000216)**	• *Molinia* meadows [6410] • Lowland hay meadows [6510] • Limestone pavements [8240]* • Alluvial forests [91E0]* • Lutra lutra (Otter) [1355]	2.3km (3.3 km via surface water)
Lough Derg, North-east Shore SAC (Site code: 002241)	• Juniper Scrub [5130] • *Cladium* Fens [7210]* • Alkaline Fens [7230] • Limestone Pavement [8240]* • Alluvial Forests [91E0] * • Yew Woodland [91J0] *	19km (29.2km via surface water)
Middle Shannon Callows SPA (Site code: 004096)	• Whopper Swan [A038) • Wigeon [A050] • Corncrake [A122] • Golden Plover [A140] • Lapwing [A142] • Black-tailed Godwit [A156]	2.3km

Site Name	Qualifying Interests/Special Conservation Interests	Distance
	• Black-headed Gull [A179] • Wetland and Waterbird [A999]	
River Little Brosna Callow SPA (Site code: 004086)	• Whooper Swan [A038] • Wigeon [A050] • Teal [A052] • Pintail [A054] • Shoveler [A056] • Golden Plover [A140] • Lapwing [A142] • Black-tailed Godwit [A156] • Black-headed Gull [A179] • Greenland White-fronted Goose [A395] • Wetland and Waterbird [A999]	4.48km
Lough Derg (Shannon) SPA (Site code: 004058)	• Cormorant [A017] • Tufted Duck [A061] • Goldeneye [A067] • Common Tern [A193] • Wetland and Waterbirds [A999]	19km (29.2km via surface water

(Note * = Priority Habitat)

River Shannon Callows SAC (Site code: 000216)

The River Shannon Callows is described in the site synopsis as a long and diverse site which consists of seasonally flooded, semi-natural, lowland wet grassland, along and beside the river between the towns of Athlone and Portumna. Along much of its length the site is bordered by raised bogs (many, but not all, of which are subject to large-scale harvesting), esker ridges and limestone-bedrock hills. The site has a common boundary, and is closely associated, with two other sites with similar habitats, River Suck Callows and Little Brosna Callows.

Site specific objectives have not been published for the site. The generic Conservation Objective is to *maintain or restore the favourable conservation condition of the Annex 1 habitat(s) and/or Annex 11 species for which the SAC has been selected.*

The SAC is located 2.3 km north-west of the and there is hydrological connectivity between the development site and the SAC via watercourses both within and adjacent to the site boundary that flow into the River Shannon.

As noted above, the site is selected for 4 no. habitats (2 no. listed as priority habitat) and for I no. species. The potential for potential significant effects on 3 of these habitats (Molinia meadows, lowland hay meadows, limestone pavement) is excluded due to their terrestrial nature, distance from the site or lack of a complete source-pathway-receptor chain. There exists potential for significant effects on *Alluvial forests* and *Otter* arising from the pollution of surface water during construction, operation and decommissioning stages of the development. As there are no detailed Conservation Objectives published for the site, the targets/attributes for Lough Derg North East Shore SAC with similar qualifying habitat were considered (Table 6-2).

With regard to the habitat *Alluvial forest*, the habitat was not identified within or adjacent to the development site. No works are proposed within 2.3km of the SAC. There will, therefore, be no direct impacts on the habitat area or its distribution arising from the proposed development. The identified pathway for effect is through deterioration in water quality during construction, operation and decommissioning stages of the development. These effects could arise from a release of suspended solids during earthworks, release of hydrocarbons or other materials to watercourses. There is potential for accelerated run-off of surface water during operation from proposed hard standing areas within the site, which could lead to erosion and bank disturbance. The potential for water pollution to result in deterioration of the substrate on which the *Alluvial forest* habitat forms and potential impediment of ground flora and regeneration of tree and shrub species is identified in the NIS.

A suite of mitigation measures are proposed to avoid water pollution (detailed below). Subject to the implementation of these measures the development will not result in any adverse impacts which would adversely affect the extent of this habitat

within the SAC. The mitigation measures will block any potential pathway for effect on this habitat and there will be no alteration in the size, area, structure, hydrological regime, vegetative composition or distribution of the habitat arising from the proposed development.

Otter is the only qualifying species within the River Shannon Callows with the potential to be impacted by the development. The targeted surveys indicated the presence of otter within the study area but no holts or couches were recorded. The species could potentially be impacted by water pollution resulting in a deterioration of habitat and a loss of prey sources. As no site-specific conservation objectives for the site have been published, the targets/attributes for an SAC, where otter are a qualifying feature were examined (Table 6-1). The specific conservation objective for the qualifying interests is *'To maintain or restore the favourable conservation condition of the Annex 1 habitat(s) and/or the Annex11 species for which the site is selected.*

Subject to the implementation of the suite of mitigation measures proposed to protect water quality and attenuate flows there will be no significant decline in the extent of terrestrial or freshwater habitat associated with the proposed development. No instream works are proposed and all major works will be located over 50m from any significant watercourse and a 10m buffer will be maintained around all major drains. No significant effects on Otter are, therefore, likely to arise.

I accept the conclusions reached in the NIS that following an examination, evaluation and analysis, in light of the best scientific knowledge and on the basis of objective information, having taken into account the relevant mitigation measures, it can be concluded that the proposed development will not have any significant adverse effects on the River Shannon Callows SAC.

Lough Derg, North-east Shore SAC (Site code: 002241)

Lough Derg, is one of the largest bodies of freshwater in Ireland. The site is of significant ecological interest, with six habitats listed on Annex 1 of the E.U. Habitats Directive and four of these are priority habitat.

Detailed site-specific conservation objectives have been published for the site, with the overall objective being *to maintain or restore the favourable conservation*

condition of the Annex 1 habitats(s) and/or the Annex 11 species for which the SAC is selected.

The SAC is hydrologically connected to the site of the proposed development and lies c 29km downstream. The significant distance removes any possibility of direct effects. The potential exists for indirect effects from a deterioration in water quality during construction, operation and decommissioning of the development. Whilst this is considered remote, due to the distance involved, the habitats with the potential to be affected include *Calcareous fens*, *Alkaline Fens* and *Alluvial forests*. Due to the terrestrial nature of the other habitats (juniper scrub, limestone pavement,Yew woodland) and the lack of identified pathway for impact was, the potential for significant effects does not arise.

The identified pathway for effect on each of the habitats with the potential to be impacted is from a deterioration in water quality, which has the potential to result in deterioration of the substrate on which these habitats are formed and potential impediment of ground flora and regeneration of species that dominate this habitat. The targets/attributes for the conservation of each of these habitats is considered in the context of the proposed development in the NIS (Table 6-3 to 6-5).

Subject to the implementation of the proposed measures to avoid water pollution, it is not considered that the development would impact on the area, size, distribution, hydrology or ecological processes that influence the vegetation composition of the *Calcareous and Alkaline Fen* habitats within the SAC. Similarly, there will be no alteration in the size, area, structure, hydrological regime, vegetative composition or distribution of the *Alluvial forest* habitat arising from the proposed development. The mitigation measures will block any potential pathway for effect on these habitats.

The proposed SAC is located a significant distance from the development site and the measures proposed which involve standard best practice and environmental controls are sufficient to address the potential effects of the development and to ensure that the integrity of the SAX and the habitats it supports.

I accept the conclusions reached in the NIS that following an examination, evaluation and analysis, in light of the best scientific knowledge and on the basis of objective information, having taken into account the relevant mitigation measures, it can be

concluded that the proposed development will not have any significant adverse effects on the LoughDerg, North-east Shore SAC.

Lough Derg (Shannon) SPA (Site code: 004058)

Lough Derg is the largest of the River Shannon lakes and is of importance for both breeding and wintering birds. It is of high ornithological importance as it supports nationally important breeding populations of Cormorant and Common Tern. In winter it has nationally important populations of Tufted Duck and Goldeneye. Parts of the SPA are a Wildfowl Sanctuary. The site is selected for 4 no species (cormorant, tufted duck, goldeneye and common tern) and for Wetlands and Waterbirds.

The site has a generic conservation objective *to maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA:*

There is a second conservation objective for this site *to maintain or restore the favourable condition of the wetland habitat at Lough Derg (Shannon) SPA as a resource for the regularly-occurring migratory waterbirds that utilise it*.

As the site lies c 29km from the site, there is limited potential for displacement, disturbance or collision risk effects on any of the bird species for which the site is elected. The potential exists for indirect effects through hydrological connectivity and the discharge of deleterious matter to watercourses in the vicinity of the site on *Wetland and Waterbirds,* which could potentially impact on food availability and the nesting/foraging value of wetland habitat.

The development is assessed against the attributes and targets for this SCI habitat (Table 6-6). There will no direct loss or decrease in the habitat associated with the proposed development which is well removed from the boundaries of the SPA. Best practice measures to mitigate potential impacts on surface water quality will be implemented as part of the development as detailed in the CEMP. Subject to the implementation of these measures there will be no significant effects on the SPA or the habitats/species for which it is designated.

I accept the conclusions reached in the NIS that following an examination, evaluation and analysis, in light of the best scientific knowledge and on the basis of objective information, having taken into account the relevant mitigation measures, it can be

concluded that the proposed development will not have any significant adverse effects on Lough Derg (Shannon) SPA.

Middle Shannon Callows SPA (Site code: 004096)

The Middle Callows SPA is a long and diverse site which extends approximately 50km from the town of Athlone to the town of Portumna. It has extensive areas of callow, or seasonally flooded, semi-natural, lowland and wet grassland, along both sides of the river. Other habitats of smaller area which occur alongside the river include lowland dry grassland, freshwater marshes, reedbeds and wet woodland. The diversity of semi-natural habitats present and the size of the site attract a diversity of bird species.

The generic Conservation Objective is *to maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for the SPA;*

There is also a second conservation objective which is to *maintain or restore the favourable conservation condition of the wetland habitat at Middle Shannon Callows SPA as a resource for the regularly-occurring migratory waterbirds that utilise it.*

The SPA is located 2.3km from the development site and is hydrologically connected via watercourses within and adjacent to the site that flow into the River Shannon. The proposed works have the potential to cause deterioration of water quality during the construction, operational and decommissioning stages of the development. This creates the potential for indirect impacts on *'Wetland and Waterbirds'* through changes in food availability and the nesting foraging value of the wetland habitat.

There are no detailed Conservation Objectives published for the site. The development is therefore assessed against the targets/attributes for Lough Derg Shannon with similar qualifying habitat (Table 6-6). There will no direct loss or decrease in the habitat associated with the proposed development which is outside the boundaries of the SPA. The potential for indirect effects arising from a deterioration in water quality (food availability and nesting/foraging habitat) will be mitigated by the suite of measures proposed to protect water quality. Subject to the implementation of these measures there will be no significant effects on the SPA or this SCI.

The site is also within the core foraging area and provides suitable habitat for a number of the birds of conservation interest and which were recorded during the extensive bird surveys undertaken on the site between 2017 and 2019. There is also the potential for disturbance and displacement on SCI's arising from construction and potential collision risk associated with the operation of the turbines. Corncrake, which is a feature of interest for the site was not recorded during any of these surveys. It is not considered, therefore, that the proposed development would result on any significant effects on this species. The remaining species include Golden Plover, Whopper Swan, Black-headed Gull, Lapwing, Wigeon and Black -tailed Godwit

The NIS provides a detailed assessment of the potential impact of the proposed development on each of the bird species for which the site is selected. In the case of Wigeon and Black-tailed Godwit the site is not considered to be of significance for these species which were only recorded very occasionally on the site. A potential pathway for indirect effects on the 4 no. species (Golden Plover, Whopper Swan, Black-headed Gull and Lapwing) was identified in the form of bird disturbance, displacement and collision risk

As no site-specific objectives have been published for the site, the targets/attributes for other SPA's, which are selected for these species were examined. The target for each of qualifying interests is *that long term population trends* should be *stable or increasing and there should be no significant decrease in the range timing and intensity of use of areas by these species, other than that occurring from natural patterns of variation*.

The Board will note from the Biodiversity chapter of the EIAR that a range of bird surveys have been conducted including vantage point, winter transect/waterfowl, breeding birds, migratory birds surveys etc which provides detailed information on the use of the site by different bird species. I note that the migratory vantage point surveys specifically conducted for Golden Plover, Whopper Swan and Lapwing did not reveal any connection between populations and the SPA. Similarly, no evidence of breeding Black-headed Gull travelling to and from the SPA was recorded.

While no link between the birds recorded on the site and SPA populations was established, the NIS considers the potential for disturbance, displacement and collision on local populations.

Wintering Golden Plover was recorded regularly on the site during the site surveys, but not recorded regularly using the habitats within the site boundary for roosting/foraging. There are significant areas of suitable foraging and roosting habitat in the wider area should disturbance/displacement occur. The NIS refers to post construction monitoring at 15 upland farms which showed no decline in populations post construction.

The species was recorded flying with the potential collision zone during the vantage point surveys. From the 'Random' collision risk analysis[12] undertaken, the collision risk has been calculated at a rate of 14.9 collisions per year. When considered against county populations, the collision risk (>1%) in considered to be negligible.

Based on the assessment no significant effect on the local populations of Golden Plover is predicted. No evidence of any significant connection has been established between the site and the species within the SPA during the surveys undertaken. No works will be undertaken within 2.3 km of the SPA and, therefore, the proposed development will not significantly affect the population trend or the distribution of the species within the SPA.

Whopper Swan was recorded regularly on the site. The turbine layout avoids the Drinagh wetlands where the largest flocks were recorded during 2017/2018 and 2018/2019 winter seasons. A 900m buffer zone is maintained between the wetland and the nearest turbine, which exceeds the 600m zone of sensitivity for the species as identified in Mc Guiness et al 2015 [13].

Studies have shown that operating turbines can have a displacement effect and disturbance distances of up to 300m have been cited. All turbines are located over 900m from the Drinagh wetlands. The proposed amenity trail is the only element of infrastructure located close to the wetlands, but it follows an existing track and no significant displacement is predicted.

[12] Full details provided in Appendix 7-6 of the EIAR

[13] Bird Sensitivity Mapping for Wind energy Developments and Associated Infrastructure in the Republic of Ireland. Mc Guinness et al (2015).

Small numbers of swans were occasionally recorded roosting/foraging in 3 no. locations which overlap with the development footprint (Fig 7.7.11 of Appendix 7.4). However, it is noted that Whopper Swan are an opportunistic species and may not remain loyal to specific areas of suitable habitat.

Significant displacement impacts are not anticipated on Whopper Swan. Any potential construction related displacement will be temporary and insignificant. This is due to the nature of the species, the sympathetic design of the development and the proposed retention and preservation of key habitats areas for the species in the wider area.

As no link has been established between the birds of the site and the SPA populations and the lack of significant effects on local populations, it is considered that the potential for significant effects on the SPA populations can be excluded.

To establish the potential for collision a 'Random' collision risk analysis was undertaken which indicates that the losses due to the windfarm would increase the annual mortality of the county population by 0.21% The predicted collision risk is therefore negligible (>1%).

Based on the assessment no significant effect on the local populations of Whooper Swan is predicted. No significant connection has been established between the site and the species within the SPA during the surveys undertaken and, therefore, it can be concluded that the proposed development will not significantly affect the population trend or the distribution of the species within the SPA.

Wintering black-headed gull were rarely recorded on the site. While there is a large breeding population in the area and surrounding Noggus Bog to the north, no active breeding colony was recorded within the development site during the two years of surveys that form the core data set used in this assessment. Only slight disturbance and displacement impacts are predicted on the local breeding population. No connection has been made between these birds and those breeding in the surrounding SPA's.

The species was recorded flying within the potential collision risk zone during the vantage point surveys, A 'Random' collision risk analysis was undertaken which concluded that the risk was low in the context of the local breeding population. No

adverse effects on the integrity of any SPA population are anticipated regarding collision risk.

Based on the assessment no significant effect on the local populations of black-headed gull is predicted. No evidence of any significant connection has been established between the site and the species within the SPA during the surveys undertaken. No works will be undertaken within 2.3km of the SPA and, therefore, the proposed development will not significantly affect the population trend or the distribution of the species within the SPA.

Lapwing was not observed to regularly utilise any areas of the development site during the winter months but was primarily recorded travelling over the site. The majority of flight activity took place more than 500m from the proposed turbines and was associated with the Clooneen wetland and Stonestown wetland to the northeast. There are extensive areas of suitable habitat in the wider area, outside any potential displacement buffer, should any displacement effect occur. No significant disturbance and displacement impacts are predicted on the local wintering populations.

The collision risk associated with the species is assessed as negligible in the context of the county population (0,11%0 . No adverse effect on the integrity of any SPA population is predicted.

Based on the assessment no significant effect on the local populations of lapwing is predicted. No evidence of significant connection has been established between the site and the species within the SPA during the surveys undertaken and therefore the proposed development will not significantly eafect the population trend or the distribution of the species within the SPA.

Wigeon were only recorded on ten occasions during the site surveys between October 2017 and September 2019 and at no stage corresponding to numbers of County Importance. The development site is not considered to be of ecological importance for this species and the species was only recorded on one occasion within 500m of a proposed turbine and there is no evidence that the widgeon that was recorded were part of the SPA populations. No flights were recorded during the vantage point surveys and accordingly collision risk surveys cannot be carried out.

The collision risk of this species within the accuracy levels available to the assessment, is zero.

Based on the assessment no significant effect on the local populations of wigeon is predicted. No evidence of significant connection has been established between the site and the species within the SPA during the surveys undertaken and therefore the proposed development will not significantly affect the population trend or the distribution of the species within the SPA.

Black tailed godwit was only recorded on one occasion during the two-year survey period, consisting of a small flock in flight over the Drinagh wetlands. The development site is not considered to be of significance to the species. No flights were recorded during the vantage point surveys and accordingly collision risk surveys cannot be carried out. The collision risk of this species within the accuracy levels available to the assessment, is zero.

Based on the assessment no significant effect on the local populations of black tailed godwit is predicted. No evidence of any significant connection has been established between the site and the species within the SPA during the surveys undertaken. No works will be undertaken within 2.3 km of the SPA and, therefore, the proposed development will not significantly effect the population trend or the distribution of the species within the SPA.

I accept the conclusions reached in the NIS that following an examination, evaluation and analysis, in light of the best scientific knowledge and on the basis of objective information, having taken into account the relevant mitigation measures, it can be concluded that the proposed development will not have a significant adverse effect on the Middle Shannon Callows SPA.

River Little Brosna Callows SPA (Site code: 004086)

The River Little Brosna Callows SPA follows the River Brosna from its confluence with the River Shannon for approximately 9km south-eastwards. It extends along both sites of the river in counties Offaly and Tipperary. The main habitat present is the extensive area of low-lying callow grassland along the floodplain of the river.

The site is identified in the NPWS site synopsis as one of the top sites in the country for wintering waterfowl. It is stated to be of international importance on account of the total number of birds that use it, as well as for its Greenland White-fronted Goose,

Golden Plover and Black-tailed Godwit populations. There are a further seven species with nationally important populations several of which are the largest in the country.

The generic Conservation Objective is *to maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for the SPA:*

There is a second conservation objective for this site *to maintain or restore the favourable condition of the wetland habitat at River Little Brosna Callows SPA as a resource for the regularly-occurring migratory waterbirds that utilise it.*

The site is located 4.48 km to the southwest of the site. There is no hydrological connectivity between the site and the SPA which removes the potential for significant effects on *Wetland* habitats as a result of a deterioration in water quality. The proposed development is within the core foraging distance or provides suitable habitat for a number of birds for which the site is selected. There is potential for bird disturbance and displacement as a result of construction activity. The potential risk of collision may arise during the operational stage.

Greenland White-fronted goose and Pintail were not recorded during the bird surveys and accordingly, it is not considered that the proposed development will result in any significant effect on these species. The NIS provides a detailed assessment of the potential impact of the proposed development on the remining 8 no. species for which the site is selected. Six of these species are also qualifying interests of the Middle Shannon Callows SPA, which are discussed above in terms of their use of the site, potential for disturbance/displacement and collision risk which is not repeated below. These include Golden Plover, Whopper Swan, Black-headed Gull, Lapwing, Wigeon and Black-tailed Godwit. No evidence of any significant connection has been established between the development site and the species within the River Little Brosna SPA. No works are proposed within 4.5km of the SPA and therefore the proposed development will not significantly affect the population trend or the distribution of the species within the SPA.

The 2 no. remaining species are Shoveler and Teal. Shoveler was not recorded within 500m of the proposed turbine locations and numbers of ecological significance were not recorded. There is no evidence that the species recorded on the site were

part of the SPA populations. No flights were recorded during the vantage point surveys and accordingly collision risk cannot be carried out. The collision risk is assessed to be zero.

As no site-specific conservation objectives for the site have been published, the targets/attributes for the River Shannon and River Fergus SPA which contains detailed conservation objectives for this species were examined. The targets is that long term population trends should be stable or increasing and there should be no significant decrease in the range, timing and intensity of use of areas by shoveler other than that occurring from natural patterns of variation.

Based on the assessment no significant effect on the local populations of Shoveler is predicted. No evidence of significant connection has been established between the site and the species within the SPA during the surveys undertaken. No works will take place within 4.5km of the SPA and therefore the proposed development will not significantly affect the population trend or the distribution of the species within the SPA.

Teal - A potential pathway for indirect effects was identified in the form of bird disturbance and displacement. Specific migratory vantage point surveys were undertaken to determine any connection between the birds recorded on the site and the SPA populations. No such link was established.

The majority of Teal were observed at the Drinagh wetlands to the east of the proposed turbine locations. The dominant on site habitat is cutover bog which is considered sub-optimal foraging habitat for this species. The proposed amenity trail is the only infrastructure in proximity to Drinagh. The trail follows an existing track in this location and no significant displacement is predicted.

As no site-specific conservation objectives for the site have been published, the targets/attributes for the River Shannon and River Fergus SPA which contains detailed conservation objectives for this species were examined. The targets is that long term population trends should be stable or increasing and there should be no significant decrease in the range, timing and intensity of use of areas by teal other than that occurring from natural patterns of variation.

Based on the assessment no significant effect on the local populations of Teal is predicted. No evidence of significant connection has been established between the

site and the species within the SPA during the surveys undertaken. No works will take place within 4.5km of the SPA and therefore the proposed development will not significantly affect the population trend or the distribution of the species within the SPA.

Mitigation Measures

The development site lies outside of the boundaries of the Natura 2000 sites and accordingly there is no potential for direct impacts on any site. There is potential for indirect effects associated with hydrological linkages and a deterioration in water quality during construction, operation and decommissioning. The impacts on water quality has the potential to result in negative effects on the SAC's and two of the SPA's that are designated for Wetlands and Waterbirds. There is potential for indirect effects due to bird disturbance/displacement.

Mitigation measures to reduce impacts on water quality

A suite of mitigation measures are proposed to address the potential significant effects of the development on water quality. The measures proposed are targeted to avoid and reduce potential impacts on the designated sites and their qualifying interests. This is achieved in the first instance through avoidance of sensitive sites and the application of suitable buffer zones around watercourses, which could act as pathways for contaminants.

Mitigation will also be achieved by design. The windfarm drainage system will link into the existing bog drainage system and discharge from each of the bog sites via existing large settlement ponds which are regulated under licence by the EPA. The aim is to minimise waters arising on the site, to adequately treat water that does arise and to ensure that the hydrological function of the watercourses on the site and the wider catchment are not affected by the proposed works.

Details of the mitigation measures to protect water quality during each phase of the development are set out in detail in the Hydrology and Hydrogeology chapter of the EIAR, the CEMP and are summarised in Section 3.5 of the NIS. The CEMP will be in place prior to the commencement of work and it will provide details of the construction methodology for each element of the development, coupled with drainage design and management to avoid sediment entering watercourses (source controls, in-line controls and treatment systems). It will also include measures to

prevent other deleterious matter from entering into watercourses including appropriate storage of fuel and hazardous material, measures to avoid release of cement-based products from the site, dust/noise control measures, peat stability management, invasive species management, waste management and an Emergency Response Plan.

An ECoW will be appointed, who will oversee the work and the implementation of the CEMP. There will also be inputs as required from other personnel including a Project Ecologist, Project Hydrologist and Project Geotechnical Engineer/Geologist.

During the operational stage, it is acknowledged that increase in run-off coupled with increased velocity of flow could arise from the replacement of the peat or vegetated surface with impermeable surfaces. This would have the potential to increase hydraulic loading and erosion of watercourses with impacts on water quality. It is proposed to mitigate the potential impact by design. Run-off from the new infrastructure will be collected locally in new proposed silt traps, settlement ponds and vegetated buffer areas prior to release into the existing drainage network. These new proposed drainage measures will create additional attenuation to what already exists. The measures will include the installation of interceptor drains up-gradient of the proposed infrastructure to collect clean surface water run-off. Collector drains will gather runoff from access roads and hard stand areas and channel it to the new local settlement ponds for settling. All surface water runoff will pass through the settlement ponds at the existing bog outfall locations prior to discharge to surface water systems.

Decommissioning stage mitigations measures will be similar to those employed at construction stage, but the potential for impacts will be significantly less, given that much of the infrastructure will remain in place.

The DoCHG notes the applicant's proposal to integrate the proposed drainage into the existing drainage system and questions why no assessment has been made of the in-combination effects on qualifying interests of the European sites. The Board will note that the only species listed as a qualifying interest for the SAC's within the zone of influence of the proposed development is Otter, which uses the site for commuting and foraging. The species, coupled with 'Wetlands and Waterbirds for which the SPA'a are selected, would be impacted by water pollution. I consider that it

is reasonable to conclude that the cessation of peat operations on the site, coupled with the proposals for increased settlement and attenuation within the drainage system is likely to improve water quality downstream of the proposed development and in combination effects are not likely to arise.

Mitigation measures to reduce bird disturbance

A potential for indirect effects in the form of bird disturbance was identified potentially affecting Middle Shannon Callows SPA and River Little Brosna SPA (golden plover, whooper swan, black-headed gull, lapwing, wigeon, black tailed godwit, teal and shoveler). The NIS details the measures have been put in place to mitigate significant negative effects on avian receptors. This includes mitigation by design of the proposed development and management of its development phases.

Mitigation by design

- The proposed development has been designed to avoid the most sensitive areas for birds within the study area, which includes the Drinagh Wetlands.
- Sensitive hydrological features are also avoided where possible, by the application of suitable buffer zones.
- Hard standing area have been designed to the minimum size necessary to accommodate the turbine model that is selected.
- The proposed substation and associated grid connection will be located entirely within the site. The windfarm will be connected to the national grid through the existing 110kV line that crosses the north-eastern section of the site. These areas have been subject to detailed bird surveys over a two year period.

Mitigation by development phase

To reduce disturbance to bird species during construction/decommissioning, noise limits and control measures will be in place and the hours of operation of the site will be controlled. Pre-construction transect /walkover bird surveys will be undertaken to ensure that significant effects on breeding birds will be avoided. An Ecological Clerk of Works (ECoW) will be appointed who will undertake a pre-construction transect/walkover bird survey to ensure that significant effects on breeding birds will

be avoided. The ECoW will be responsible for any ornithological and ecological issues that may arise

In Combination Effects

Section 7 of the NIS considers plans and projects that may contribute to cumulative and/or in-combination effects:

Offaly County Development Plan 2014-2020 contains policies and objectives to prohibit any development that would be harmful or would result in a significant deterioration of the habitats and/or disturbance of species in European Sites. It seeks to protect the county's biodiversity and natural heritage including landscapes, wildlife habitats including rivers, wetlands, bogs, fens etc. The plan was subject to SEA which concluded that subject to the full and proper implementation of the mitigation measures and adherence to polices, objectives and landuse zonings contained in the Plan including appropriate site level investigations, that significant adverse effects on the environment can be avoided.

The proposed development is designed to avoid direct impacts on any Natura 2000 site. The potential for indirect effects are avoided through appropriate mitigation measures to protect water quality. It is not, therefore, considered that the potential exists for the implementation of the plan to act cumulatively and/or in-combination with the proposed windfarm to result in significant adverse effects on the environment.

The NIS also considers other projects and land uses in the locality with the potential to result in cumulative impacts on European sites. Table 7-2 of the NIS details planning applications on the site of the proposed development which consist of Bord na Mona related applications and Telecommunications infrastructure. There have been a number of commercial and utility type developments have been granted planning permission in the vicinity of the site. Details of other windfarm developments within a 20km radius of the site are set out in Table 6-3.

I agree with the conclusion reached in the NIS, that subject to the implementation of the proposed mitigation measures, there is no potential for the proposed development to impact on the integrity of any designated site or its qualifying interests. Consequently, there is no potential for the proposed development to act

cumulatively, or in combination with other projects to result in significant negative effects on the environment.

Conclusion on Appropriate Assessment

Having regard to the nature of the proposed development, the hydrological distance between the development site and European Sites, the detailed assessment of birds using the site, the mitigation measures proposed, the information presented with the application, including the Natura Impact Statement, which I consider is adequate to carry out an assessment of the implications of the proposed development on the integrity of European sites, I consider it reasonable to conclude that the proposed development, individually or in combination with other plans and projects would not adversely affect the integrity of the River Shannon Callows SAC (Site code: 000216), Lough Derg, North-east Shore SAC (Site code:002241), Middle Shannon Callow SPA (Site code: 004096), River Little Brosna Callow SPA (Site code 004086), Lough Derg (Shannon) SPA (Site code: 004058) or any European site, in view of the site's Conservation Objectives.

11.0 Recommendation

Note: I would point out to the Board that the correspondence received from the EPA indicates that the IPC conditions for Licence P0500-1 remains in place for any activity on the site, including the construction phase of the wind farm, until such time as the EPA approve surrender of the licence. This includes the management of silt/settlement ponds and any emission limit values and agreed trigger levels for discharges to surface water.

Having regard to the foregoing, I recommend that planning permission be granted for the proposed development for the reasons and considerations set out below, subject to compliance with the attached conditions and in accordance with the following Draft Order.

Reasons and Considerations (Draft Order)

In coming to its decision the Board has regard to the following:

(a) the national policy with regard to the development of alternative and indigenous energy sources and the minimisation of emissions from greenhouse gases,

(b) the National Peatlands Strategy 2015-2025,

(c) the Eastern and Midlands Regional Spatial and Economic Strategy 2019-2031,

(d) the 'Wind Energy Guidelines-Guidelines for Planning Authorities' issued by the Department of the Environment, Heritage and Local Government in June 2006, and the Draft Wind Energy Guidelines published by the Department of Housing Local Government and Heritage in December 2019.

(e) the relevant policies of the planning authority as set out in the Offaly County Development Plan 2014-2020,

(f) the character of the landscape in the area and the absence of any ecological designation on or in the immediate environs of the wind farm site,

(g) the characteristics of the site and of the general vicinity,

(h) the pattern of existing and permitted development in the area, including other wind farms,

(i) the distance to dwellings or other sensitive receptors from the proposed development,

(j) the Environmental Impact Assessment Report.

(k) the Natura Impact Statement.

(l) the submissions made in connection with the application and the response to further information, and

(m) the report of the Inspector.

Appropriate Assessment: Stage 1

The Board noted that the proposed development is not directly connected with or necessary for the management of a European Site.

In completing the screening for Appropriate Assessment, the Board accepted and adopted the screening assessment and conclusion reached in the Inspector's report

that the River Shannon Callows Special Area of Conservation (Site Code: 000216), the Lough Derg North-east Shore Special Area of Conservation (Site Code: 002241), the Middle Shannon Callows Special Protection Area (Site Code: 004096), the River Little Bosna Callows Special Protection Area (Site Code: 004086) and Lough Derg (Shannon) Special Protection Area (Site Code:004048) are the European Sites for which there is a possibility of significant effects and which, must, therefore be subject to Appropriate Assessment.

Appropriate Assessment: Stage 2

The Board considered the Natura Impact Statement and all other relevant submissions and carried out an appropriate assessment of the implications of the proposed development for the European Sites in view of the Sites' Conservation Objectives (namely the River Shannon Callows Special Area of Conservation (Site Code: 000216), the Lough Derg North-east Shore Special Area of Conservation (Site Code: 002241), the Middle Shannon Callows Special Protection Area (Site Code: 004096), the River Little Bosna Callows Special Protection Area (Site Code: 004086) and Lough Derg (Shannon) Special Protection Area (Site Code:004048). The Board concluded that the information before it was adequate to allow for a complete assessment of all aspects of the proposed development and to allow them reach complete, precise and definitive conclusions for appropriate assessment.

In completing the Appropriate Assessment, the Board considered, in particular, the following:

i. the likely direct and indirect impacts arising from the proposed development both individually or in combination with other plans or projects,

ii. the mitigation measures which are included as part of the proposal,

iii. the conservation objectives for the European Sites'

iv. the views contained in the submissions.

In completing the appropriate assessment, the Board accepted and adopted the appropriate assessment carried out in the Inspectors report in respect of the potential effects of the proposed development on the integrity of the aforementioned European Sites', having regard to the site's conservation objectives.

In overall conclusion, the Board was satisfied that the proposed development, by itself or in combination with other plans or projects, would not adversely affect the integrity of the European Sites, in view of the site's conservation objectives and there is no reasonable doubt remaining as to the absence of such effects.

Environmental Impact Assessment:

The Board completed an environmental impact assessment of the proposed development taking account of:

(a) the nature, scale, location and extent of the proposed development,

(b) the Environmental Impact Assessment Report and associated documentation submitted in support of the planning application, including further information,

(c) the submissions received during the course of the application, and

(d) the Inspector's report.

The Board considered that the environmental impact assessment report, supported by the documentation submitted by the applicant, adequately considers alternatives to the proposed development and identifies and describes adequately the direct, indirect, secondary and cumulative effects of the proposed development on the environment. The Board agreed with the examination, set out in the Inspector's report, of the information contained in the environmental impact assessment report and associated documentation submitted by the applicant and submissions made in the course of the planning application.

Reasoned Conclusions on the Significant Effects

The Board considered that the main significant direct and indirect effects of the proposed development on the environment are, and would be mitigated, as follows:

- **Population and Human Health: Noise, vibration and shadow flicker** during the construction and/or the operational phases would be avoided by the implementation of the measures set out in the Environmental Impact Assessment Report (EIAR) and the Construction and Environment Management Plan (CEMP).

- **Biodiversity:** Habitat loss associated with construction will impact on habitats of generally low ecological value with no rare or protected species recorded**.** Potential impacts to habitats and faunal species (including badger, otters, bats, marsh fritillary), aquatic fauna and invertebrates and avian species would be mitigated by the implementation of the measures during the construction and/or operational phases set out in the Environmental Impact Assessment Report, the Biodiversity Management Plan, and the Lapwing, Waterfowl and Wader Enhancement Plan.
- **Landscape and Visual**: Localised visual impacts will occur primarily from intermittent sections of the local roads in proximity to the site and from local properties. The impact of the development coupled with existing and permitted windfarms in the vicinity, will have a cumulative impact on the visual character of the wider landscape. These impacts will not be avoided, mitigated, or otherwise addressed by means of condition. The impact is balanced by the nature of the cutover bog landscape, which has been significantly impacted by peat production activities and which is robust.
- **Hydrology and Hydrogeology**: Impacts to surface water and ground water would be mitigated by the implementation of the measures set out in the Environmental Impact Assessment Report and the Construction and Environment Management Plan. The proposed surface water management system would be integrated with the existing bog drainage system, with additional treatment and attenuation provided.
- **Climate:** Impacts are assessed as positive associated with the generation of renewable energy.
- **Material Assets** (Roads & Traffic) will be mitigated during construction by the measures set out in the Environmental Impact Assessment Report and by a Traffic Management Plan required by condition. The main impacts will occur during the construction stage which will be short-term and temporary. Impacts during the operational stage would be negligible.

The Board is satisfied that the reasoned conclusion is up to date at the time of making the decision.

The Board completed an environmental impact assessment in relation to the proposed development and concluded that, subject to the implementation of the mitigation measures proposed as set out in the EIAR, and subject to compliance with the conditions set out below, the effects of the proposed development on the environment, by itself and in combination with other plans and projects in the vicinity, would be acceptable. In doing so, the Board adopted the report and conclusions of the Inspector.

Having considered the totality of the Environmental Impact Assessment Report, associated documentation submitted with the application and the report of the Inspector, the Board concluded that any likely significant effects on the environment would be mitigated by the mitigation measures proposed by the applicant.

Proper planning and sustainable development:

The proposed development is located on a site, only part of which lies within an area identified as open for consideration for Wind Energy Development, as outlined in Map 3.2 of the Offaly County Development Plan 2014-2020.

Having regard to the

- location of the site in a large cutaway bog, which is recognised as being suitable for large scale wind farms in the development plan,
- the information provided in the Environmental Impact Assessment Report, which shows that the entire area of the development site displays similar characteristics and that no reasonable distinction can be made between the areas that lie within, or, outside the areas identified as ‘open for consideration’,
- the positive contribution the proposed development would make to Irelands national strategy policy on renewable energy and its move to a low carbon future,

It is considered that subject to compliance with the conditions set out below the proposed development would accord with European, national, and regional planning and related policy, would not seriously injure the visual or residential amenities of the area or of property in the vicinity, would not have an unacceptable impact on the landscape or ecology, would not pose a risk to water quality and would be acceptable in terms of traffic safety and convenience. The proposed development

would, therefore, be in accordance with the proper planning and sustainable development of the area.

12.0 **Conditions**

1. The proposed development shall be carried out and completed in accordance with the plans and particulars lodged with the application, and the further plans and particulars received by the Board on the 24th day of September, 2020, except as may otherwise be required in order to comply with the following conditions. Where such conditions require details to be agreed with the planning authority, the developer shall agree such details in writing with the planning authority prior to commencement of development and the proposed development shall be carried out and completed in accordance with agreed particulars.

   Reason: In the interests of clarity.

2. The mitigation measures and monitoring commitments identified in the Environmental Impacts Assessment Report and other plans and particulars submitted with the application shall be implemented in full.

   Reason: In the interests of clarity and the protection of the environment during the construction and operational phases of the proposed development.

3 The mitigation measures contained in the Natura Impact Statement submitted with the application shall be implemented in full.

   Reason: In the interest of clarity and the proper planning and sustainable development of the area and to ensure the protection of European sites.

4 The period during which the proposed development hereby permitted may be constructed shall be 10 years from the date of this Order.

Reason: In the interests of clarity.

5 This permission shall be for a period of 30 years from the date of the first commissioning of the wind farm.

Reason: To enable the planning authority to review the operation of the wind farm in the light of the circumstances then prevailing.

6 The developer shall ensure that all peat related and spoil mitigation measures set out in the Peat and Spoil Management Plan are implemented in full and monitored throughout the lifecycle of the construction works and monitored throughout the operational phase.

Reason: In the interests of protection of the environment.

7 Prior to any development taking place on the site the developer shall submit for the written agreement of the planning authority, the final detail and specification of the proposed grid connection route.

Reason: In the interests of clarity and proper planning and development.

8 Decommissioning and construction works shall be limited to between 0800 and 18.00 hours Monday to Saturday and shall not be permitted on Sundays or public holidays.

Reason: To protect the amenities of nearby residential properties

9 The operation of the proposed development, by itself or in combination with other permitted wind energy development, shall not result in noise levels when measured externally at nearby noise sensitive locations, which exceed:

(a) Between the hours of 0700 and 2300:

i the greater of 5 dB(A) $L_{90,10mins}$ above background noise levels, or 45 dB(A) $L_{90,10mins}$, at standardised 10-meter height above ground level wind speed of 7m/s or greater.

ii 40 dB(A) $L_{90,10\ mins}$ at all other standardised 10-meter height above ground level wind speeds.

(b) 43 dB(A) $L_{90,10\ mins}$, at all other times.

Prior to commencement of development, the developer shall submit to and agree in writing with the planning authority a noise compliance monitoring programme for the subject development, including any mitigation measures such as the de-rating of particular turbines. All noise measurements shall be carried out in accordance with ISO Recommendation R 1996 “Assessment of Noise with Respect to Community Response” as amended by ISO Recommendation R 1996-1. The results of the initial noise compliance monitoring shall be submitted to and agreed in writing with the planning authority within 6 months of the commissioning of the wind farm.

Reason : In the interests of residential amenity.

10 The developer shall comply with the with the following shadow flicker requirements:

(a) Cumulative shadow flicker arising from the proposed development shall not exceed 30 minutes in any day or 30 hours in any year at any dwelling.

(b) The proposed turbines shall be fitted with appropriate equipment and software to control shadow flicker at dwellings.

(c) Prior to commencement of development, a wind farm shadow flicker monitoring programme shall be prepared by a consultant with experience of similar monitoring work, in accordance with details to be submitted to the planning authority for written agreement. Details of the monitoring programme shall include the proposed monitoring equipment methodology to be used, and the reporting schedule.

Reason: In the interests of residential amenity.

11. The developer shall comply with the following design requirements:

(a) The wind turbines, including masts and blades, and the wind monitoring masts shall be finished externally in a light-grey colour.

(b) Cables within the proposed development site shall be placed underground.

(c) The wind turbines shall be geared to ensure that the blades rotate in the same direction.

(d) No advertising material shall be placed on or otherwise affixed to any structure on the site without a prior grant of permission.

Reason: In the interests of visual amenity.

12 Details of the materials, colours and textures of all the external finishes of the proposed substation building and enclosing fencing shall be submitted to and agreed in writing with the planning authority, prior to commencement of the development.

Reason: In the interests of the visual amenities of the area.

13 Within one year of the commissioning of the wind farm, details of amenity trails and public access arrangements, set out in the planning application documents, and the timescale for their realisation shall be submitted to the planning authority for their written agreement.

Reason: In the interests of advancing the recreational amenities of the area.

14 Prior to commencement of development, details of a pre-construction and post construction monitoring and reporting programme for birds shall be submitted to, and agreed in writing with the planning authority prior to commencement of development. The surveys shall be undertaken by a suitably qualified and experienced bird specialist and shall include measures to reduce disturbance to ground nesting species. The surveys shall be completed annually for a period of five years following commissioning of the wind farm and copies of the report submitted to the planning authority and to the Department of Housing, Local Government and Heritage (National Parks and Wildlife Service).

Reason: To ensure the appropriate monitoring of the impact of the proposed development on the avifauna in the area.

15 Prior to commencement of development the developer shall submit the following plans for the written agreement of the planning authority:

(a) Biodiversity Management Plan,
(b) Lepidoptera Management Plan, and
(c) Lapwing, Waterfowl and Habitat Enhancement Plan.

Reason: In order to protect and enhance biodiversity within the site

16 Prior to commencement details of a post construction monitoring and reporting programme for bats shall be submitted to and agreed in writing with the planning authority. Monitoring shall be undertaken by a suitably qualified and experienced bat specialist and identify any measures required to mitigate any identified effects. The surveys shall be completed annually for a period of three years following commissioning of the wind farm and copies of the report submitted to the planning authority.

Reason: To ensure the appropriate monitoring of the use of the site by bat species.

17 Prior to commencement of development, the community gain proposals shall be submitted to the planning authority for written agreement. In default of agreement, the matter shall be referred back to An Bord Pleanala for determination.

Reason: In the interests of the proper planning and sustainable development of the area.

18 In the event that the proposed development causes interference with telecommunications signals, effective measures shall be introduced to minimise interference with telecommunications signals in the area. Details of these measures, which shall be at the developer's expense, shall be submitted to, and agreed in writing, with the planning authority prior to commissioning of the turbines and following consultation with the relevant authorities.

Reason: In the interests of the protection of telecommunications signals and of residential amenity.

19 Details of aeronautical requirements shall be submitted to, and agreed in writing with the planning authority prior to commencement of the development. Prior to the commissioning of the turbines, the developer shall inform the planning authority and the Irish Aviation Authority of the as-constructed tip heights and co-ordinates of the turbines in WGS-84 format and the wind monitoring masts.

Reason: In the interests of air traffic safety.

20 The developer shall comply with the requirements of Irish Water with regard to diversion of infrastructure within the site and connections to the public network.

Reason: In the interests of public health.

21 Prior to any development taking place on the site, the developer shall submit the following to the planning authority for written agreement:

(a) Road Safety Audit(s) relating to junction works proposed on the national road network,
(b)Technical Acceptance for the proposed N62 underpass structure,

in accordance with the detailed requirements of Transport Infrastructure Ireland.

Reason: In the interests of traffic safety.

22 (a) Prior to commencement of the development, a traffic management plan for the construction phase shall be submitted to, and agreed in writing with, the planning authority. The traffic plan shall incorporate the following:

i. Details of the road network/haulage routes and the vehicle types to be used to transport materials to and from the site and a schedule of control measures for exceptionally wide and heavy delivery loads.

ii. A condition survey of the roads and bridges along the haul routes shall be carried out at the developer's expense by a suitably qualified person both before and after the construction of the proposed development. This survey shall include a schedule of required works to enable the haul routes to cater for construction related traffic. The extent and scope of the survey and the schedule of works shall be agreed within the planning authority/authorities/ Transport Infrastructure Ireland prior to commencement of development.

iii. Detailed arrangements whereby the rectification of any construction damage which arises shall be completed to the satisfaction of the planning authority.

iv. Detailed arrangements for the protection of bridges to be crossed.

v. Detailed arrangements for temporary traffic arrangements/control on roads and protocols to keep residents informed of upcoming traffic related matters, temporary lane/road closures and delivery of turbines.

vi. A phasing programme indicating the timescale within which it is intended to use each public route to facilitate construction of the proposed development. In the event that the proposed development is being

developed concurrently with any other windfarm in the area, the developer shall consult with and arrange suitable traffic phasing arrangements with the planning authority,

vii. Within three months of the cessation of the use of each public road and haul route to transport material to and from the site, a road survey and scheme of works detailing works to repair any damage to these routes shall be submitted to, and agreed in writing with the planning authority.

(b) All works arising from the aforementioned arrangements shall be completed at the developer's expense within 12 months of the cessation of each road's use as a haul route for the proposed development.

Reason: To protect the public road network, the amenity of local residents and to clarify the extent of the permission in the interest of traffic safety and orderly development.

23 Within one months of the cessation of the use of the proposed haul road connecting the N52 and N62 north of Kennedy's Cross, the access road shall be covered with top-soil, reseeded and the gates shall be permanently locked. The future use of the access road shall be restricted to oversized deliveries required for turbine maintenance purposes only associated with the windfarm and shall be subject to prior notification and the written agreement of the planning authority. The access shall not be used for any other purpose.

Reason: In the interest of traffic safety and to preserve the carrying capacity of the national road network

24 The developer shall facilitate the preservation, recording and protection of archaeological materials and features that may exist on or within the site. In this regard, the developer shall:

(a) notify the planning authority in writing at least four weeks prior to the commencement of any site operations (including hydrological or geotechnical investigation) relating to the proposed development,

(b) employ a suitably qualified archaeologist who shall monitor all site investigations and other excavation works,

The assessment shall address the following issues:

(i) the nature and location of archaeological material on the site, and
(ii) the impact of the proposed development on such archaeological material.

A report, containing the results of the assessment, shall be submitted to the planning authority and, arising from this assessment, the developer shall agree in writing with the planning authority details regarding any future archaeological requirements (including, if necessary, archaeological excavation) prior to commencement of construction works.

In default of agreement on any of these requirements, the matter shall be referred to An Bord Pleanala.

Reason: In order to conserve the archaeological heritage of the area and to secure the preservation (in-sit or by record) and protection of any archaeological remains that may exist on the site.

25 On full or partial decommissioning of the windfarm, or if the windfarm ceases operation for a period of more than one year, the turbines and all decommissioned structures shall be removed, and foundations covered with soil to facilitate re-vegetation. These reinstatement works shall be completed to the written satisfaction of the planning authority within three months of decommissioning or cessation of operation.

Reason: To ensure satisfactory reinstatement of the site upon cessation of the project.

26 Prior to commencement of the development, the developer shall lodge with the planning authority a cash deposit, a bond of an insurance company, or other such security as may be acceptable to the relevant planning authority, to secure the reinstatement of public roads which may be damaged by the transport of materials to the site, coupled with an agreement empowering the relevant planning authority to apply such security or part thereof to the satisfactory reinstatement of the public roads. The form and amount of the security shall be as agreed between the relevant planning authority and the developer or, in default of agreement shall be referred to An Bord Pleanala.

Reason: The ensure the satisfactory reinstatement of the delivery routes.

27 Prior to commencement of the development, the developer shall lodge with the planning authority a cash deposit, a bond of an insurance company, or other such security as may be acceptable to the planning authority, to secure the satisfactory reinstatement of the site upon cessation of the project, coupled with an agreement empowering the planning authority to apply such security or part thereof to such reinstatement of the site. The form and amount of the security shall be as agreed between the planning

authority and the developer or, in default of agreement shall be referred to An Bord Pleanala.

Reason: To ensure the satisfactory reinstatement of the site.

28 The developer shall pay to the planning authority a financial contribution in respect of public infrastructure and facilities benefiting development in the area of the planning authority that is provided or intended to be provided by or on behalf of the authority in accordance with the terms of the Development Contribution Scheme made under section 48 of the Planning and Development Act 2000, as amended. The contribution shall be paid prior to the commencement of development or in such phased payments as the planning authority may facilitate and shall be subject to any applicable indexation provisions of the Scheme at the time of payment. Details of the application of the terms of the Scheme shall be agreed between the planning authority and the developer or, in default of such agreement, the matter shall be referred to An Bord Pleanala to determine the proper application of the terms of the Scheme.

Reason: It is a requirement of the Planning and Development Act, 2000, as amended, that a condition requiring a contribution in accordance with the Development Contribution Scheme made under Section 48 of the Act be applied to the permission.

Breda Gannon
Senior Planning Inspector

May 25th, 2021