Graffy Wind Park

ENVIRONMENTAL IMPACT

ASSESSMENT REPORT (EIAR)

VOLUME 1: NON-TECHNICAL SUMMARY

GRAFFY WIND PARK, GLENTIES COUNTY DONEGAL

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Contents

1.0 INTRODUCTION:

An Environmental Impact Assessment Report (EIAR) has been compiled by Harley Planning Consultants on behalf of Cuilfeach Teoranta for the construction of an eight-turbine wind park and associated infrastructure, including a substation with cable connections to each turbine, a temporary construction compound, a meteorological mast and peat restoration areas in the townlands of Graffy, Meenamanragh, Dalraghan More and Meenagrubby, approximately 8.5 kms east of Glenties, County Donegal. The EIAR also addresses the construction of a grid connection, approximately 7 kms long, from the proposed substation at Meenagrubby to the Tievebrack ESB station at Drumnalough through the townlands of Meenagrubby, Meenamanragh, Graffy, Banganboy, Stracashel, Meenamalragh, Drumconcoose and Drumnalough. Finally, to facilitate deliveries of turbines, the EIAR addresses the strengthening, widening and culvert extensions along the existing public road through the townlands of Lugaveen, Tieveragh, Dalraghan More, Meenamanragh and Graffy and a new road section at Lugaveen.

The EIAR presents information on the identification and assessment of the potential significant environmental effects of the proposed development and will accompany the planning application to be submitted to Donegal County Council. The EIAR consists of three volumes:-

- Volume 1, a non-technical summary,
- Volume 2, the main report assessing a range of environmental issues by expert professionals and
- Volume 3, 3A & 3B, containing appendices associated with the main report in Volume 2.

This Non-Technical Summary (NTS) summarises the Environmental Impact Assessment Report (EIAR).

2.0 BACKGROUND:

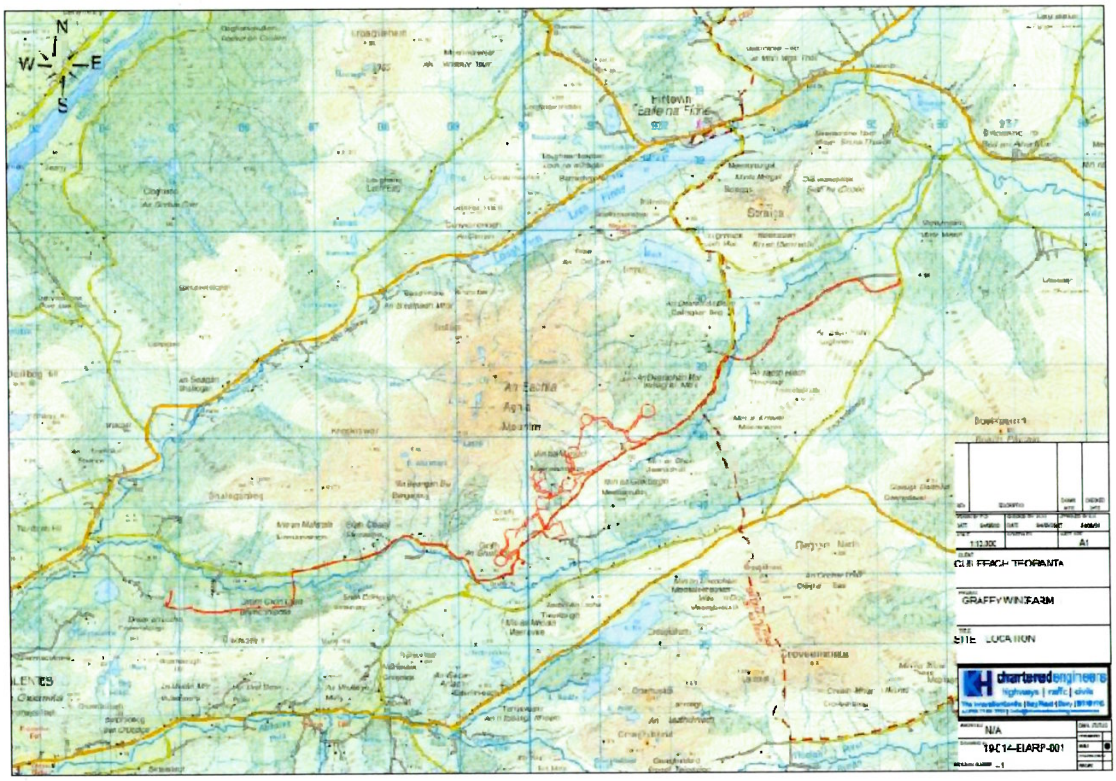
In February 2011, planning permission was granted to PJ Molloy for a wind park in the townlands of Graffy, Meenaleenaghan, Dalraghan More, Meenamanragh, Meenavale, Greenans, Stralinchy & Mully – planning reference (PL 05B.237656). The development consisted of 13 turbines, a control building, ESB substation and compound and associated site roads and works. The planning permission was acquired by Cuilfeach Teoranta, although the permission has just expired in February 2021. To take account of newer and more efficient wind turbine technologies, which have become available since the original development was

granted planning permission, it is now proposed to develop and repower the wind park by reducing the number of turbines to eight (8) larger and more efficient turbines.

3.0 LOCATION & DESCRIPTION:

The wind park is located approximately midway between the R250 and R253 regional roads, each of which joins Glenties to Ballybofey. It is circa 8.5kms ENE from Glenties and 6kms SW of Fintown. Map 1 below shows the location of the wind park.

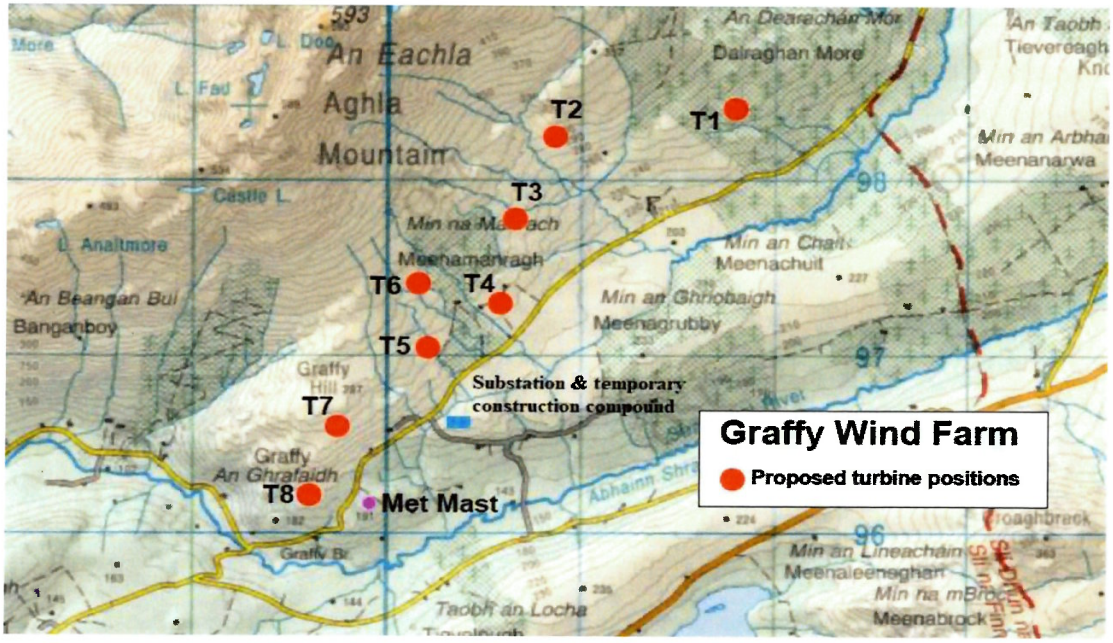
Map 1: General location of wind park



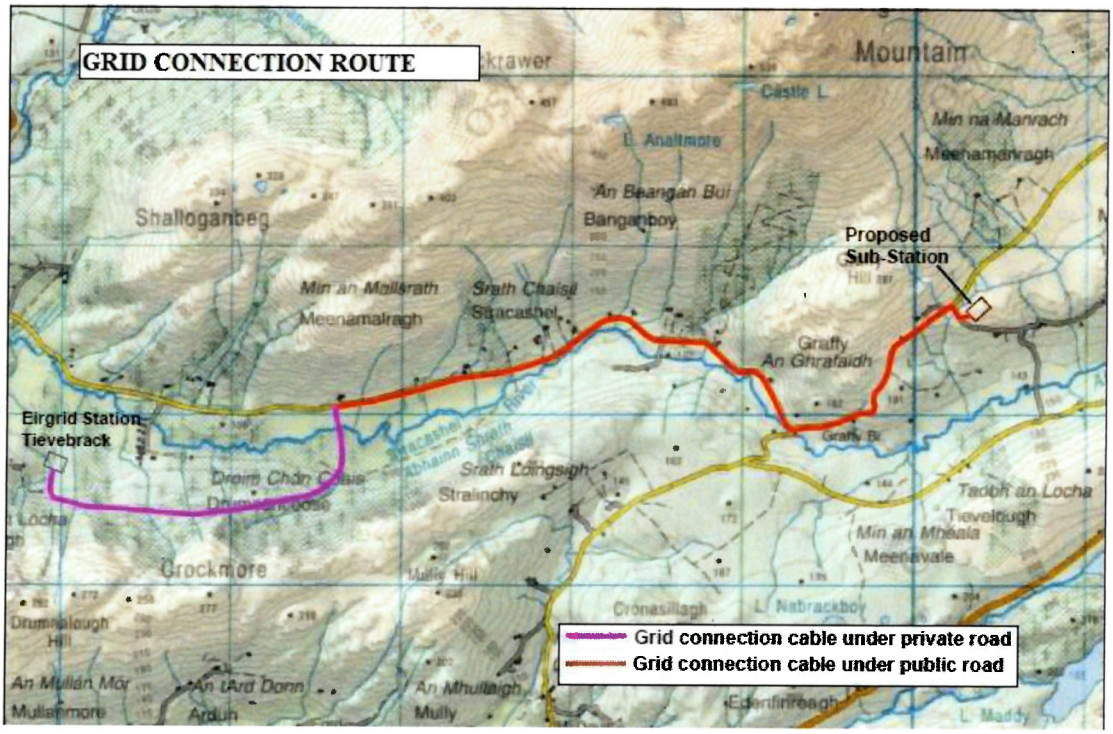
Access tracks to each turbine, a substation, cables connecting the turbines to the proposed substation, a meteorological mast, peat recovery areas and a temporary construction compound, all form part of the new wind park. In addition, the proposal will include the development of a grid connection from the proposed substation at Meenagrubby, serving the wind park to the Tievebrack ESB station at Drumnalough, approximately 7kms west of the wind park site. To facilitate delivery of turbines and associated parts, the development will further involve the strengthening, widening and extension of culverts along existing roads and the development of a new section of road.

Map 2 below, shows the proposed wind park layout, while Map 3 outlines the grid connection between the proposed substation at Meenagrubby to the Tievebrack Eirgrid station at Drumalough. All cabling and grid connections will be laid underground

Map 2: Proposed wind park layout



Map 3: Grid connection to the Tievebrack Eirgrid station at Drumalough



4.0 ENVIRONMENTAL IMPACT ASSESSMENT REPORT:

In accordance with planning regulations, an environmental impact assessment report (EIAR) must be prepared by developers for wind parks with more than 5 turbines or having a total output of greater than 5 megawatts. The EIAR must demonstrate potential impacts and set out mitigation measures to address any identified impacts. A summary of the EIAR background information is presented in this chapter along with the various environmental assessments in the EIAR.

4.1 Policy on sustainable energy.

4.1.1 At a national level, Ireland currently depends largely on fossil fuels for its energy needs, accounting for 91.9% of 2016 total primary energy requirements (TPER) (*Energy in Ireland 1990-2016*, SEAI December 2017), but showing an overall downward trend from 1990 when it accounted for 98.2% of TPER. National policy supports the development of alternative and indigenous energy sources and the minimisation of emissions from greenhouse gases.

4.1.2 Consecutive Irish governments and regional authorities have mirrored the EU approach to climate action. In July 2021, the Government passed the Climate Action & Low Carbon Development (Amendment) Act 2021, amending earlier climate change targets, to significantly strengthen the framework for governance of climate action by the State in order to realise national, EU and international climate goals and obligations. The Act will set Ireland on the path to a climate neutral economy by no later than the end of the year 2050. Wind energy will play a pivotal role in attaining the targets.

4.1.3 Ireland's draft National Energy & Climate Plan (NECP) 2021-2030, to meet the EU's energy and climate targets for 2030, was submitted to the European Commission in December 2018. The NECP was drafted before a new Government committed to achieving a 7% annual average reduction in greenhouse gas emissions between 2021 and 2030. While the NECP does not reflect this higher commitment, Ireland is currently developing those policies and measures and intends to integrate the revision of the NECP into the process.

4.1.4 Ireland has identified three key targets for 2030 of at least 40% cuts in greenhouse gas emissions (from 1990 levels), a 27% share for renewable energy and a 27% improvement in energy efficiency.

4.1.5 The Regional Spatial and Economic Strategy (RSES) for the Northern and Western Region was adopted on 24th January 2020 and identifies the importance of a reliable, high-quality,

electricity supply, which is particularly important if the region is to attract high technology industries. To ensure the NW region has sufficient capacity and resilience in its electricity supply, RSES highlights, as an urgent priority for the region, the need for reinforcement of the electricity grid, which is predicated on the level of renewable generation in both Donegal and its hinterland in western Northern Ireland.

4.1.6 At local level, the Donegal CDP 2018-2024 (the Plan) addresses the issue of sustainable energy in Chapter 8.2 "Energy". Policy E-P-10 in the Plan confirms that development proposals for wind energy shall be in accordance with the requirements of the Wind Energy Development Guidelines: Guidelines for Planning Authorities, 2006 (or as may be amended).

4.1.7 However, under a High Court order on the 5th day of November, 2018, (Planree Limited V Donegal County Council) certain provisions of the County Donegal Development Plan 2018-2024 [Section 6.5(c) and (f) of the Wind Energy standards at Part B: Appendix 3, Development Guidelines and Technical Standards and Map 8.2.1] were ordered to be deleted and/or removed from the County Donegal Development Plan 2018-2024.

4.1.8 The locations for the wind turbines are located in an area, which has been designated as an Area of Especially High Scenic Amenity (EHSA) in the County Donegal Development Plan 2018-2024. However, the wind farm site is not located near any scenic route and is not identified within designated views in the County Donegal Development Plan 2018-2024. Under Policy NH-P-6, it is a policy of the Council *to protect areas identified as Especially High Scenic Amenity on Map 7.1.1: 'Scenic Amenity'. Within these areas, only developments assessed to be of strategic importance or developments that are provided for by policy elsewhere in this Plan shall be considered.*

4.1.9 While Policy NH-P-6 is unclear regarding the extent of the *strategic importance*, it is considered that the proposed development is of strategic importance, nationally, regionally and locally, which allows for its consideration with EHSA areas. The development's strategic importance is highlighted as follows:

- Central to the success of Project Ireland 2040 [a combination of the The National Development Plan (NDP) and the National Planning Framework (NPF)], is the national objective of *achieving a transition to a competitive, low carbon, climate-resilient and environmentally sustainable economy by 2050.* The proposed development would have strategic importance to the North West region generally and specifically to County Donegal, which is isolated within the region.

- The proposed development would help fulfil National Policy Objectives under the National Planning Framework (NPF). In particular, NPO 54 in the NPF seeks to

  'Reduce our carbon footprint by integrating climate change action into the planning system in support of national targets for climate policy mitigation and adaptation objectives, as well as targets for greenhouse gas emissions'

  In addition NPO 55 in the NPF, seeks to

  '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'
- The Regional Spatial and Economic Strategy (RSES) for the Northern and Western Region was adopted on 24th January 2020 and came into immediate effect. The RSES drills down from and supports the implementation of the National Planning Framework (NPF) and the relevant economic policies and objectives of the Government. RSES identifies the importance of a reliable, high-quality, electricity supply, which is particularly important if the region is to attract high technology industries. To ensure the NW region has sufficient capacity and resilience in its electricity supply, RSES highlights, as an urgent priority for the region, the need for reinforcement of the electricity grid, which is predicated on the level of renewable generation in both Donegal and its hinterland in western Northern Ireland. The proposed development would support the robustness of the electricity to County Donegal and the NW region.
- The proposed development would make a significant contribution to meeting Ireland's renewable energy and greenhouse gas reduction targets, included in the Climate Action Plan 2019. It is anticipated that the development would be worth a significant amount to the regional and local rural economies.
- The proposed development would form a strategic cog in the Climate Action & Low Carbon Development (Amendment) Act 2021, enacted in July 2021. This Act amends earlier climate change targets, to significantly strengthen the framework for governance of climate action by the State in order to realise national, EU and international climate goals and obligations.

4.1.11 Despite the High Court case [Planree and Donegal County Council] referred to in paragraph 4.1.7 above, which deleted certain aspects of the Donegal County Council wind energy policy, a significant level of policy on wind energy is provided for elsewhere in this Plan. As such,

under Policy NH-P-6 the development can be given consideration within EHSA areas. The policies are:

Policy E-P-2 It is a policy of the Council seeks to facilitate the appropriate development of renewable energy from a variety of sources, including, hydro power, ocean energy, bioenergy, solar, wind and geo-thermal and the storage of water as a renewable kinetic energy resource, in accordance with all relevant material considerations and the proper planning and sustainable development of the area.

Policy E-P-10 states it is the policy of the Council that development proposals for wind energy shall be in accordance with the requirements of the Wind Energy Development Guidelines – Guidelines for Planning Authorities 2006 (or as maybe amended).

Policy E-P-14 states that it is the policy of the Council to support voluntary initiatives from developers/renewable energy operators for community benefits, in accordance with other policies of this plan and the proper planning and sustainable development of the area.

Policy E-P-16 states it is the policy of the Council to support the strengthening and enhancement of the capacity of existing wind farms, within the local environmental capacity including the sustainable upgrade/replacement of older turbines with newer more efficient models.

Policy E-P-20 states that it is the policy of the Council that proposals for renewable energy development will have regard to the cumulative effect of the development on the environment when considered in conjunction with other existing and permitted developments in the area.

Policy E-P-21 states that it is the policy of the Council that all applications for renewable energy projects will ensure that details of the proposed grid connection and all associated infrastructure, are considered in any Environmental Impact Statement and Natura Impact Statement as maybe required.

4.1.12 Tourism Policy TOU-P-5 in the County Donegal Development Plan 2018-2024, confirms that the Council will not permit development which would materially detract from visual and scenic amenities along the route of the Wild Atlantic Way. The route of the Wild Atlantic Way lies over 10kms to the west of the Graffy Wind Farm and only long distance views are afforded from the route, which the Landscape and Visual Impact Assessment (Chapter 3 Volume 1and Appendix 2 Volume 3 in EIAR) considered to be negligible.

4.1.13 There are a number of guidance documents, plans and strategy documents concerning wind energy development. These include

- 'Wind Farm Development - Guidelines for Planning Authorities' Department of the Environment, Heritage & Local Government, June 2006,
- Draft Wind Energy Development Guidelines December 2019 by the Department of Housing, Planning and Local Government,
- Strategy for Intensifying Wind Energy Deployment, Renewable Energy Strategy Group 2000.

4.2 Need for the Proposed Development

4.2.1 Wind energy offers the opportunity for Ireland to reduce its greenhouse gas emissions. while adding power to the national electricity grid. It will reduce the country's reliance on imported sources of energy, while using indigenous resources and creating employment. The cost of generating energy from wind is made up primarily of the capital cost with low operational costs, which ensures energy price stability.

4.2.2 Wind energy is recognised as the renewable source of energy, which is the fastest and most economical to put into operation. As such, it is considered of vital importance in the short to medium term in Ireland's national policy regarding the production of green energy.

4.3 Benefits of Wind Energy Development

4.3.1 The benefits of wind energy include the following:

- Provision of much needed electrical capacity.
- Zero greenhouse gas emissions to the atmosphere during operation and contribution towards attainment of Kyoto targets.
- Abatement of other pollutants and environmental protection.
- Reduction of energy importation.
- Use of indigenous resources.
- Security of energy supply.
- Improvement of the balance of payments. Ireland paid €3.4 billion for fuel imports in 2016, down from €4.6 billion in 2015.
- Energy price stability.
- Contribution to sustainable development.
- Avoidance of fines for not meeting 2020 targets.

4.4 Public Attitudes to Wind Energy

4.4.1 Throughout the development of wind energy technology, public attitudes towards clean and renewable energy generation have been surveyed regularly. On the whole, the public favours

the development of renewable energy in combination with increased energy efficiency to meet energy needs.

4.4.2 In a research summary of independent studies in the UK, which canvassed individuals living close to an existing or proposed site, every study demonstrated that the overwhelming majority of residents in areas with a wind park favour wind power, both in theory, as a renewable energy source and in practice in their areas. While wind energy was, in general, highly supported, areas with a wind park had an even higher support rate. An average of 8 out of 10 people supported their local wind park. Other surveys had similar results including surveys in Wales, the Netherlands, Sweden and North America.

4.4.3 In Ireland, the Irish Wind Energy Association (IWEA) commissioned a survey by Drury Research, published in 1999. The survey found that 67% of respondents agreed that the Government should support the development of wind energy in Ireland and 93% of those aware of wind energy are in support of its development. When asked to rank forms of energy in terms of their environmental friendliness, wind power attracted the highest mean score and perceived disadvantages of wind power were much more likely to centre around its ability to provide a continuous power supply, more so than any perceived unsightliness.

4.4.4 In 2003, Sustainable Energy Ireland (SEI – now SEAI) completed a series of surveys on the attitude of the public towards wind parks in Ireland. The results show that Irish people are generally positively disposed to wind parks, with 8 out of 10 of those questioned favourable to the construction of more wind parks in Ireland.

4.4.5 In 2007, Fáilte Ireland in association with the Northern Ireland Tourist Board carried out a visitor survey on the attitudes of tourists, both domestic and overseas holiday-makers, to wind energy projects. The majority of the respondents (85%) perceived wind parks as a positive, with 15% negative towards wind parks.

4.5 Alternatives to Proposed Development

4.5.1 Alternatives to the proposed development can be considered in terms of:

- Alternative sites.
- Alternative site layout and design.
- Alternative technologies.

4.5.2 The assessment of alternative sites for the turbines is not realistically available to the applicant. The eight proposed turbines will be located generally at the positions of the turbines granted under the recently expired planning permission (PL 05B.237656). The original

landowners own the lands on which the turbines are proposed and if granted, they will replace the previously permitted wind turbines on these sites.

4.5.3 The design and layout of the turbines was informed by the environmental and technical constraints associated with the site, including available land bank, offset distances with a minimum of four times the blade diameter from third-party dwellings, minimum distances between wind turbines, depth of peat and positions of the permitted turbines.

4.5.4 The size of the turbines selected for the wind park design optimises the predicted wind regime of the site. Maximising the efficiency of the turbines at the site, increases the environmental and climate change benefits of the project by increasing the offset of greenhouse gases.

4.5.5 In terms of alternative technology, if the wind turbines are not developed, then fossil fuel power stations will likely be used to provide the required quantities of electricity. This will contribute to greenhouse gas and pollutant production.

4.5.6 As Eirgrid has identified the Tievebrack substation as the end point for a grid connection, the method of connection of the wind park energy to the substation, is the only alternative to be considered. EirGrid has insisted that the grid connection be underground and located along private and public roads, where access to the grid connection would be available. In addition, feed-back from the local community confirmed that underground grid connection was the only acceptable option.

4.6 Consultation

4.6.1 A comprehensive scoping and consultation task was undertaken during the preparation of the EIAR. This included circulation of a scoping document to statutory and non-statutory consultees. Furthermore, members of the Glenties Municipal Area of Donegal County Council were provided with details of the project.

4.5.7 Most importantly, a comprehensive public consultation exercise was carried out, despite extenuating circumstances as a result of the Covid 19 pandemic outbreak. Initial discussions with the local community commenced in September 2018 and a representative for the developers, actively engaged with the landowners and others in the community, by individually calling with householders.

4.5.8 It had been planned to hold a public meeting in the local Edeninfagh Hall in early April 2020, but the escalation of the Covid 19 virus and Government advice restricting contacts by groups of people, prohibited this preferred means of public consultation engagement with the local

community. At the time of writing, no relaxation in the Government restrictions on assembly of groups of people, to control transmission of the virus, had emerged.

4.5.9 As an alternative, a public information document, outlining information pertaining to the proposal, was circulated to 71 house owners/occupants in the vicinity of the proposed wind energy development. The information document included a map of the proposal, a description of the project, an anticipated project timetable and an outline of the environmental and social benefits that the development would have both locally and globally. A pre-paid response letter for the recipients to provide comments was also included with the information letter.

4.5.10 A dedicated website (www.graffeywindpark.com) for the project was also created to enable comments to be made and also confirming that the website would continue to be available for up-dates on the construction and operation of the project. In addition, residents were advised that submissions could be sent by email to comments@graffywindfarm.com.

4.5.11 Details of the project were also advertised in three local newspapers circulating in the area, seeking feed-back and advising that a dedicated website had been created to enable comments to be submitted. The notice was published in the Derry People/Donegal News, the Peoples Press and in the Donegal Democrat, which are the identified newspapers for publication of planning notices, by Donegal County Council.

4.5.12 Following the initial lockdown in March 2020, due to the pandemic outbreak, the developers had hoped to arrange a public meeting later in the year and before the submission of the planning application. Unfortunately, the upgrading of County Donegal to Level 3 of the pandemic control mechanism in late September and the national lockdown at the beginning of 2021, has prevented the holding of a public meeting.

4.5.13 A planning application (21/51202) was submitted to the Planning Authority on 16th June 2021, but was withdrawn following a High Court JR decision (Sweetman V ABP [2021] IEHC 390), which determined that there was inadequate detail in respect of design and in particular, that the turbine heights and blade lengths were expressed in terms of *maxima*, not the actual proposed dimensions. As the submitted application, 21/51202 confirmed maxima dimensions for the wind turbines, it was decided to withdraw the application and re-submit with specific turbine dimensions.

4.5.14 Two turbines models have been identified, the Nordex 133 and the Enercon 126, the detailed dimensions of which are outlined below. Details of the specific wind turbine models have also been uploaded to the project website (www.graffeywindpark.com).

Turbine Model	Hub Height	Rotor Diameter	Blade Tip Height
Enercon 126	85.94 metres	127 metres	149.44 metres
Nordex 133	83 metres	133.2 metres	149.6 metres

4.7 Cumulative Effects

4.7.1 The EIAR considers the potential for cumulative effects from the proposed development with other key existing, permitted or proposed projects. Cumulative effects are addressed in each chapter of the EIAR, under the relevant environmental heading.

5.0 ENVIRONMENTAL TOPICS ASSESSMENTS

5.1 A range of environmental topics were assessed by experienced professionals and presented in the EIAR. The topics are (i) landscape & visual impact (ii) population & human health including shadow flicker, (iii) noise, (iv) soils, geology and hydrogeology, (v) surface water & hydrology, (vi) air quality & climate change, (vii) cultural heritage, (viii) roads & traffic (ix) biodiversity (x) material assets and (xi) electro-magnetic effects. Finally, an assessment of the interaction of these environmental topics was carried out, wich is outlined in paragraph 6 below.

5.2 The assessments on each environmental topic are set below.

5.2.1 LANDSCAPE & VISUAL IMPACT

5.2.1.1 The landscape and visual impact assessment describes the change of likely effects on the landscape character and on the visual amenity arising from the proposed optimisation of 8 turbines at the formerly permitted 13 turbine wind park site at Graffy Wind Park, Glenties, Co. Donegal. The assessment provides an analysis of landscape and visual changes as experienced from settlements, public roads and designated landscapes and considers that a comparative analysis with the recently expired permission remains relevant, as the baseline has remained unaltered.

5.2.1.2 The study area of the assessment considers an area of 20km radius from the centre of the proposed development site. The landscape and visual impact comparison assessment is accompanied by 7 photomontages taken at representative viewpoints, Zone of Theoretical Visibility (ZTV) mapping and landscape designation figures. ZTV mapping illustrates the theoretical visibility of the wind park development if there were no intervening vegetation or built structures, i.e. a bare earth scenario. It therefore shows the worst case scenario.

5.2.1.3 The proposed turbine models and their dimensions are listed below. However a blade diameter of 132 metres and a hub height of 84 metres, resulting in a blade-tip height of 150 metres, have been assessed to cover both wind turbine models.

Turbine Model	Hub Height	Rotor Diameter	Blade Tip Height
Enercon 126	85.94 metres	127 metres	149.44 metres
Nordex 133	83 metres	133.2 metres	149.6 metres

5.1.2.4 Site surveys assessed the character of the landscape and the most sensitive features and views. ZTV mapping was used to indicate the visibility of the previously permitted development and the proposed development, as well as the difference in visibility between both. The ZTV mapping also supported the identification of suitable and representative viewpoints, which have been turned into photomontages showing what the proposed development and the previously permitted look like in comparison. The assessment describes landscape and visual effects which are a result of the impact of the proposed development. Landscape effects are the result of physical changes to the fabric of the landscape. Visual effects relate closely to landscape effects, but concern changes in views.

5.1.2.5 **Visual Effects**

The majority of views will be experienced within a core study area of approximately 5km, where open or partial views of the development are possible, particularly in views from close proximity and elevated views within an approximate 2km radius. The highest change in visual effects will likely occur in short and middle-distance views, particularly from elevated areas, where there are no or few intervening hills / or vegetation.

5.1.2.6 The increase in turbine visibility is not considered significant due to the long distance (between approximately 8-20km) and the relatively small extent of areas with additional views, which are generally attached to areas with existing views of the formerly permitted wind park. Areas to the southwest and west benefit also from a higher percentage of tree cover and other intervening vegetation, which will reduce the effects of additional visibility considerably.

5.1.2.7 Larger areas of additional visibility are generally located to the north and east of the proposed development site, with increased theoretical visibility areas located at a distance between 3-20km. The majority of additional visibility occurs between 4-15km to north of the site in areas located on higher ground and slopes facing south, which are generally upland areas with low vegetation or areas not publicly accessible.

5.1.2.8 There will be no increase in visibility from locations around Lough Beagh and the majority of publicly accessible locations of Glenveagh National Park due to the introduction of the proposed development. Similar to the formerly permitted development, visibility of the proposed development at a distance of approximately 26km and more will be highly weather dependent. The wind park will be one point of focus amongst others in wide panoramic views.

5.1.2.9 **Cumulative Landscape and Visual Effects**

A number of existing wind parks are located within the 20km study area. Based on the ZTV mapping the most relevant existing wind park for assessing cumulative effects is Loughderryduff Wind Farm, which is located approximately 15km to the west.

5.1.2.10 Areas with a likely cumulative visibility of both schemes are limited to the western extent of the study area, elevated areas north relating to the Glendowan Mountains and Slieve Sneacht as well as along the northern and western slopes of the Blue Stack Mountains in the south. The majority of cumulative effects between both developments occurs in areas away from the public road network and in areas not generally accessible to the public. Joint visibility from the public road network will be from small pockets and both developments will be perceived as fully separate schemes.

5.1.2.11 The proposed development will not result in a significant increase in cumulative landscape and visual effects, due to the distance between both developments and the location, scale and nature of the proposed development.

5.1.2.12 **Mitigation**

Wind turbines are by their nature highly visible elements and cannot be easily screened. The following mitigation measures were taken into account during the planning of the proposed development to minimise landscape and visual effects.

Wind Park

- Creation of a clear and simple layout that was visually unified and that continues to relate to the surrounding landform;
- Provision of a visual balance and harmony in the location of the turbines to create a clear and easily understandable turbine layout;
- Minimise adverse cumulative effects with other wind parks in the study area; and
- The matt white colour of the turbines are neutral and whatever the weather conditions or nature of the surrounding landscape characteristics, the turbines will never aesthetically clash in colour.

Ancillary structures (substations, underground cables, access roads):

- Restricting the siting of structures close to residential dwellings;
- Underground cables to utilise existing roads and access tracks, where possible;
- Minimise the length and land take of the proposed access roads during construction and operation;
- Access roads to be as level with the existing ground as possible;
- Application of a dark ochre colour matching the surrounding bog grassland for all substation building structures to help the integration of the buildings into the surrounding landscape in close and distant views; and
- Use of materials for building facades/cladding, fencing and gates which is local or appropriate to the area in scale, colour and design.

5.2.2 POPULATION & HUMAN HEALTH

5.2.2.1 An assessment was conducted to identify and assess the significance of the potential impacts to human beings, population and human health resulting from the development. The assessment identifies impacts and proposes mitigation to ensure that people, as individuals or communities, should experience no reduction in the quality of life or human health resulting from the direct or indirect impacts of the construction, operation and decommissioning of the proposal. The potential likely impacts of the proposed development upon humans relate to aspects of population, community, employment and economic activity, including tourism, physical land use, property values, residential amenities and also residential visual amenity assessment (RVAA) impacts. The effects on 'Human Health Receptors' of health related aspects are considered, including assessment of shadow flicker, air quality and noise/vibration resulting from the construction, operation and decommissioning of the proposed development. Reviews of various surveys and reports indicate that public attitudes towards wind park developments reveal general satisfaction with wind parks. This is particularly evident after the turbines are operational.

5.2.2.2 Graffy DED in which the proposal is located, experienced a substantial population decrease of 24.9% between 2006 and 2016, the highest rate of population decline within the study area. The population density of the area was recorded during the 2016 Census at 9.1 persons per km², which is significantly lower than the average for Ireland at 69.6 persons per km². The area has an older population compared to the national and county average, with the highest population percentage in the 44-65 age group (26.9%) and the lowest in the 15-24 age group. Agriculture, forestry and fishing and manufacturing industries employ a greater proportion of people within the area.

5.2.2.3 **Health and Safety:** Potential impacts from the proposed turbines including turbine glare effect, ice throw, and lightning are unlikely and can be mitigated by protection technologies including shut down of turbines, lightening earthing, and matt turbine finishes, to reduce glare. There is no contaminated land on the site. Radon gas would not be an issue of significant concern for the development as the only building proposed is the wind park substation, which will only have occasional human use. Dust management measures will reduce the potential for fugitive dust particles to cause a nuisance during the construction phase of the development. No significant negative health or safety impacts are thus predicted to arise.

5.2.2.4 **Noise:** Noise consultants carried out background noise monitoring and wind speed measurement, which confirmed that potential noise levels from the proposed wind turbines, including cumulative noise levels with other wind parks, comply with the appropriate noise limits for the daytime, evening and night-time periods. The proposal will be operated and monitored to comply with noise requirements and the noise generated from modern wind turbines will not result in direct adverse health impacts.

5.2.2.5 **Shadow Flicker:** Shadow flicker is the flickering effect that can be caused when rotating wind turbine blades periodically cast shadows through constrained indoor openings, such as the windows of neighbouring properties. Shadow flicker may occur under certain combinations of geographical position and time of day, when the sun passes behind the rotors of a wind turbine and casts a shadow over neighbouring properties.

Shadow flicker assessments for both the Nordex 133 and the Enercon 126 were carried out to predict the times when shadow flicker may occur as an absolute worst case scenario, identifying those dwellings where there is potential for shadow flicker to occur, and give an indication of the maximum effect that could be experienced, under conditions where the sun would be shining all the time and there would be no intervening structures or vegetation between the turbines and the receptor.

Current guidance recommends that shadow flicker at dwellings within 500 metres of a proposed turbine location should not exceed a total of 30 hours per year or 30 minutes per day. Detailed analysis has shown that no dwellings are predicted to experience shadow flicker above these limits. No significant shadow flicker impacts are thus predicted.

5.2.2.6 **Economy and Economic Benefits:** The proposal will have significant benefits for the local economy, by means of job creation and landowner payments. The development will also present the opportunity for indirect economic benefits associated especially with the construction phase of the development, as is substantiated by various economic studies.

Regarding tourism, studies have demonstrated that there is no conclusive evidence that wind park developments have an adverse impact on tourism and the proposal is not predicted to have significant adverse impact on local tourism or tourism facilities. There are no key points of notable tourism interest in proximity to the proposed development area itself, apart from the local waymarked Sli Na Finne.

5.2.2.7 **Residential Visual Amenity or Overbearance:** There will be some effects upon the visual amenity of residences located within the immediate area. The nature of the effects varies depending upon the degree of visual screening afforded by intervening vegetation and landform, the number and proportion of turbines visible and the orientation of properties relative to the proposed development. In the majority of cases, main house aspects and fenestration face away from the turbines. Assessment has concluded that the local houses will not experience overwhelming/oppressive or overbearing effects on their visual outlook as a result of the proposed turbines with effects generally considered as Minor to Moderate.

5.2.2.8 **Property values:** Various studies have found that wind energy developments have little impact on long-term property values and it is considered that the proposed development will result in no predicted impacts on local property values.

5.2.2.9 **Television signals:** If, despite precautions, significant signal interference in any form is identified and is attributed to the Graffy Wind Park turbines, appropriate remedial measures will be undertaken by the developer to eliminate any signal interference resulting from the proposed development.

5.2.2.10 **Traffic and Turbine delivery:** During the construction stage, increased traffic on local roads will result from vehicles delivering turbine components, and deliveries of civil works materials. Construction traffic will cause some disruption to traffic to local road users. A traffic management plan and engagement with local residents will be effected by the developer to minimise potential adverse impacts. Delivery of large turbine components will be scheduled to occur outside peak traffic times. Arrangements for abnormal roads and underground grid line installation will be agreed in advance with the Roads Section of Donegal County Council.

5.2.2.11 **Ancillary development:** No significant adverse and residential visual overbearance impacts are predicted from ancillary wind park developments of the proposal. The grid connection will be underground and the substation is sited on a relatively low lying area and partially screened by small knolls to the south and east, with no direct line of sight from the closest house. The lattice anemometer mast will be at least 500m from the nearest dwelling.

The in-combination cumulative effects of the proposed development with other wind energy projects in the wider study area was not found to result in significant adverse effects on population and human health aspects.

The decommissioning phase of the project will not pose any significant negative population or human health impacts. This will be managed through a decommissioning plan, to be drawn up by the developer for prior agreement with the County Council.

The ongoing EIAR process has facilitated identification of potential project impacts, which have been subject to appropriate avoidance and reduction in the iterative design of the evolving layout. Further construction and operational phase mitigation measures will be implemented to reduce all potential residual impacts to population and human health to acceptable levels. These measures will be carried forward to the construction phase of the development in the project's Construction Environmental Management Plan.

5.2.3 NOISE

5.2.3.1 A noise impact assessment has been conducted for both turbine models according to the recommended draft Wind Energy Development Guidelines 2019 (WEDG19) methodology. The predicted noise levels at each dwelling in closest proximity to the proposed wind park site were calculated in accordance with ISO9613-2:1996 under a range of operating wind speeds. The predicted noise levels have been compared with the corresponding noise limits.

5.2.3.2 It was found that the highest potential noise levels from the proposed wind turbine comply with the appropriate noise limit for the daytime, evening and night-time periods, as defined by WEDG19 as the appropriate noise limits.

5.2.3.3 In addition, a cumulative assessment was undertaken considering all further proposed, approved and operational wind energy developments within 20 km of the proposed development, where it was confirmed that there was no impact on the predicted noise levels from turbines in the wider vicinity of the site.

5.2.3.4 Potential noise impacts to residents resulting from the installation of the proposed grid connection and haul route are not considered to be significant and are in compliance with the recommendations outlined in BS 5228:2009+A1:2014.

5.2.3.5 All non-assessed sites further from the wind turbine will experience worst-case noise levels lower than the residential properties assessed in this report and therefore will also comply with the fixed limits within the WEDG19 document.

5.2.3.6 For the reasons outlined within the assessment report, Irwin Carr Consulting concluded that noise should not be considered a determining factor for this site, further to implementing the outlined curtailment strategy.

5.2.4 SOILS, GEOLOGY AND HYDROGEOLOGY

5.2.4.1 The geology of the Graffy Wind Park site consists of recent peat deposits overlaying thin deposits of glacial tills and / or bedrock. The peat is generally thin (<1m), but is found to be up to 5.4m in small peat basins occurring between bedrock ridges on the hillside. There is historic evidence of peat cutting by hand. A similar geology is found in the area of the transport route upgrade. The grid connection route follows the valley of the Stracashel River where alluvial deposits occur. The bedrock is Precambrian in age and consists of metamorphosed sedimentary rock and igneous intrusive rocks. The bedrock aquifer is poor, with wells installed capable of yielding sufficient water only for domestic supply.

5.2.4.2 There are no sites of geological importance at the site, at the transport route upgrade or along the grid connection route. There is a geological heritage site approximately 500m to the south of the grid connection route but will not be affected by the proposed development.

There is low potential for aggregate or mineral resources at the site.

Potential impacts on geology are associated largely with the construction phase of the project when earthworks operations are ongoing and the demand for large volume of aggregate and concrete. The greatest concern associated with wind park construction in peatland is the risk of peat landslide. This risk has been assessed for the Graffy site and deemed to be very low. Mitigation to minimise impacts are provided in the EIAR. Once followed, no significant impacts on geology or groundwater are envisaged.

5.2.5 SURFACE WATER & HYDROLOGY

5.2.5.1 The Graffy Wind Park, transport route upgrade and grid connection are located within the catchments of the Stracashel and Stranagoppoge rivers. Both rivers are important for fisheries and both form part of designated Special Areas of Conservation. The Stracashel is a tributary of the Owenea River, which is also recognised for its populations of freshwater pearl mussel. Although the streams draining the site of the wind park are not important for fisheries, they drain into important watercourses, so protection of water quality is an important factor in the surface water assessment.

5.2.5.2 The construction phase of the proposed wind park, transport route upgrade and grid connection have the highest potential for negative impacts on surface water quality. Siltation and nutrient

enrichment of streams may occur as a result of earthworks activities and tree felling, respectively. Use and storage of fuel and use of cement materials have the potential to impact on water quality and the important habitats and species downstream of the wind park. During operation, no water quality impacts exist and the development is not predicted to change runoff characteristics from the site or contribute to flood risk.

5.2.5.3 A comprehensive suite of mitigation measures, in accordance with best practice, is detailed in the EIAR to protect water quality during the construction works. Assuming implementation of this detailed programme of mitigation measures, the proposed wind park will not result in an adverse negative impact on surface water on site or the immediate environs.

5.2.6 AIR QUALITY & CLIMATE CHANGE

5.2.6.1 The assessment of baseline air quality in the region of the proposed wind park has shown that current levels of key pollutants are significantly lower than their limit values. Any impact of the Graffy wind park development on Ireland's total national greenhouse gas emission is slightly beneficial compared to Ireland's 2016 total greenhouse gas emissions and obligations under the EU 2020 commitments.

5.2.6.2 Any adverse impacts are predicted to occur during the construction phase, with the dominant sources of greenhouse gas emissions as a result of the development due to the construction traffic and embodied energy of construction material.

5.2.6.3 The generation of 100 GWh of electricity to the national grid during the operational phase will lead to a net saving for the development in terms of greenhouse gas emissions. The production of wind power for export to the national grid transforms the proposed cumulative impacts from negative in terms of GHGs to having a net positive annual impact on GHG emissions of the order of 0.139% of the Total Greenhouse Gas Emissions in Ireland in 2016.

5.2.6.4 A dust minimisation plan is to be followed for the construction phase of the project, as construction activities are likely to generate some dust emissions, particularly during the construction of the grid connection. The majority of any dust produced will be deposited close to the potential source and any impacts from dust deposition will typically be within several hundred metres of the construction area.

5.2.6.5 Due to the rural location of the Graffy Wind Park, there are very few sensitive receptors within 1 km of the site boundary reducing the potential for impacts greatly. The potential for dust will be limited by the dust mitigation plan resulting in a temporary impact that is classed as negligible.

5.2.7 CULTURAL HERITAGE:

5.2.7.1 The Cultural Heritage chapter in the EIAR was prepared to assess and define any impacts or effects which the construction, operation and decommissioning of the proposed development may have on the archaeological, architectural and cultural heritage resource. The chapter includes an identification of potential impacts or effects which may arise and outlines mitigation measures, based on current information, which may be used to avoid, reduce or offset any potential adverse effects.

5.2.7.2 Elements of the proposed development with the potential to impact on archaeological, architectural or cultural heritage remains are construction of the turbine bases and hardstand areas, access roads, grid connection, substation and delivery route and associated road widening. Development of these facilities will involve the mechanical excavation of topsoil and overburden down to and through geologically deposited strata at their identified locations. Operational phase effects can include visual impacts resulting from the presence of turbines in the landscape.

5.2.7.3 As a result of carrying out the assessment, the following potential archaeological, architectural and cultural heritage direct, indirect, construction, operational, decommissioning, cumulative and residual effects have been assessed.

5.2.7.4 It is considered there will be no direct or indirect construction phase effect on the recorded archaeological, architectural or cultural heritage resource, although there will be a permanent direct imperceptible construction phase effect on any previously unrecorded archaeological remains that may exist within the development area.

5.2.7.5 It is considered there will be at worst a residual long-term reversible imperceptible visual effect on the 11 Recorded Monuments located within the wind park and substation 5km study area, but there will be no residual effect on the architectural or cultural heritage resource.

5.2.7.6 It is proposed that archaeological monitoring of all groundworks associated with construction of the wind park, substation and grid connection be carried out.

5.2.7.7 It is considered there will be no decommissioning phase and no cumulative construction or operational phase effects on the archaeological, architectural or cultural heritage resource.

5.2.8 ROADS AND TRAFFIC:

5.2.8.1 This chapter assesses the delivery of materials and equipment to the site during the construction phase and traffic associated with the operational phase of the wind park. It considers the

different elements of the construction phase and assesses the capacity of the existing roads to deal with this traffic. As the proposed wind park will be constructed at the same time as the grid connection to Tieveback ESB substation the cumulative impacts associated with transport and traffic are assessed.

5.2.8.2 Direct access to the site will be provided by the existing local roads network to both the east and west, which are currently used only by local traffic and therefore experiences very low usage. Service access to the site will be off the R252 at Ballinamore and along local roads L2023, L6733 and L6743. All construction equipment will be delivered to the site via this route in addition to the import of quarry materials and disposal of unsuitable material as necessary. This route will require some localised upgrades to accommodate deliveries of some turbine elements with some temporary widening also required along the delivery route.

5.2.8.3 The chapter assesses the traffic impact during two distinctive elements of the works. Firstly enabling works to include construction of site roads, turbine foundations and ancillary installations (cable, compounds etc.) and secondly delivery/installation of turbines to include transportation of individual turbine elements and associated lifting equipment.

Before the transportation of the turbines from the port of entry at Killybegs to the wind park site and installation on site, a range of advanced enabling works will be required – namely construction of site roads, installation of assembly platforms, laying of fibre optic/electrical cables and pouring of turbine foundations.

5.2.8.4 The enabling works involves a substantial amount of HGV movements into and out of the site. While acknowledging that local traffic on the delivery route is light, a traffic management plan will be agreed with the Roads Authority engineers, to facilitate free flow of private local and construction traffic. The excavation of the public roads to lay the cable connections from the turbines to the proposed substation and particularly the grid connection from the substation to the Tievebrack ESB station, will likely result in road closures, due to the limited width of the roads. The location has the advantage of alternative access to Glenties, Letterkenny and Ballybofey by local traffic via the R252 and R253, which considerably reduces the disruption by road closures to local traffic.

5.2.8.5 The turbines will be delivered to Killybegs port in separate units from where they will be transported to the site via the regional road R263 and national road N56 to Donegal Town and thereon via the N15 to the Roadhouse premises 3kms west of Ballybofey. After travelling on the local road L-2794 to the R252, the turbines will then transported along the R252 to Ballinamore, from where local roads are used to reach the wind park site.

5.2.8.6 The greatest delivery effect on the road network will be on the days during the delivery of the abnormal indivisible loads (AILs) comprising the tower sections, the blades and the nacelles. Traffic management measures will be established, providing for the identification of a delivery schedule, details of the alterations required to the infrastructure and any other minor alterations and a dry run of the route using vehicles with similar dimensions. The transport of AILs can only be done following a comprehensive route selection, route proofing and consultation with An Garda Síochána and the local authority road section.

5.2.8.7 It is not anticipated that any sections of the local road network will be closed during turbine deliveries and that all of the deliveries comprising out-sized loads will be made outside the normal peak traffic periods, mostly likely at night, to avoid disruption to work and school related traffic.

Particular locations along the national and regional route, where the alignment may offer a confined delivery corridor, have been identified and vehicle swept path analysis carried out to highlight minor issues such as HGV overhang or temporary removal of signage and/or lamp standards.

5.2.8.8 Upgrade works, such as strengthening of the soft margin and support / reinforcement to culverts along the local roads leading to the wind park site will also be required. It is anticipated that these works will be retained, following the turbine deliveries. In addition, a new road section at Lugaveen will be constructed through Coillte forestry, to avoid a "T" junction, which would not accommodate transport of turbine elements.

5.2.8.9 Bridges and culverts along the national and regional road network and along the L-2794, between the N15 and the R252, are considered sufficiently robust to facilitate the weight of turbine deliveries.

5.2.8.10 The potential impacts on traffic and roads associated with the proposed development during the construction phase includes:-

- Increase in local daily traffic in particular an increase in standard four axle lorries carrying concrete and stone. There will also be an increase due to workers to and from the site and often the construction of wind farms will attract on-lookers.

- Transport of oversized loads approximately 11 per turbine – with an additional 4 normal loads, approximately, for turbine components delivery.

- Delivery of the cranes to the site – approximately 25 for the 2 cranes. This will depend on the type of crane used during turbine installation, but 25 loads is a worse-case scenario.

- Modification of road junctions and development of a new section of road, to accommodate easement sweeps at corners
- Grid connection operations in unison with on-site wind farm construction activity.

5.2.8.11 To mitigate against the impacts of traffic associated with the project and prior to the commencement of construction, a Traffic Management Plan will be agreed with Donegal County Council, for a delivery route for concrete and stone, a delivery route of the over-sized loads for the turbines, speed limits for HGVs on local roads to and from the site, provision of traffic control while transporting oversized loads and deliveries of AIL during off peak hours. Mitigation measures to be employed during the construction of the grid connection will provide for a prior-to-construction Traffic Management Plan agreed with Donegal County Council with a programme for road works and route for delivery of construction material, traffic diversions to minimise conflicts with construction traffic, speed limits for HGVs on local roads.

5.2.8.12 In conclusion, having regard to the very low levels of local traffic, the construction works will have an imperceptible impact, as road diversions will be in operation. There are sufficient local road alternatives, to accommodate diverted traffic. On a long-term basis, once the site is in operation, it is anticipated that the operational wind farm and the proposed turbines will not generate any adverse impacts on traffic in the vicinity of the site.

5.2.9 BIODIVERSITY

5.2.9.1 Terrestrial Ecology (Flora & Fauna):

This section of the Biodiversity Chapter of the EIAR identifies, describes and assesses the direct and indirect significant effects of the proposed development on terrestrial (flora & fauna) biodiversity. It contains a description of the terrestrial biodiversity features and designated sites within and surrounding the site of proposed development, followed by an assessment of the potential and likely significant effects of the proposed development alone and cumulatively with other consented projects on terrestrial biodiversity features and designated sites.

The assessment concludes that there are no significant environmental impacts predicted upon terrestrial biodiversity features as a result of the construction, operation or decommissioning of the proposed Graffy Wind Park project, subject to the application of mitigation measures including the appointment of an ECoW and where necessary appropriate timing of works, in addition to measures designed to prevent adverse effects upon nearby watercourses.

The assessment of designated sites concludes that potential significant environmental effects are predicted upon water quality and habitats within the West of Ardara/ Maas Road SAC and

pNHA, River Finn SAC and on a precautionary basis the River Foyle and Tributaries SAC. Mitigation has been proposed where necessary and there is no significant residual environmental effect upon these designated sites with effective implementation of the proposed mitigation measures.

In addition a Natura Impact Statement (NIS) has been prepared on behalf of Cuilfeach Teoranta in respect of the application for development consent in relation to the Graffy Windpark Project to document Habitats Directive stage 1 and stage 2 appraisals in relation to European sites.

5.2.9.2 Avi-fauna (birds):

This Section of the Biodiversity Chapter addresses the potential ecological impacts on avian populations utilising the area of an eight-turbine wind farm development proposed for Graffy Hill and adjoining townlands along the lower southern slopes of An Eachla (Aghla Mountain), *c.* 8 km east of Na Gleannta (Glenties), Co Donegal.

The site of the proposed wind farm holds a bird assemblage in keeping with what would be expected in the context of a marginalised upland site in Co. Donegal, encompassing a mosaic of semi-improved agricultural grassland, unimproved acid grassland, bog, heath and conifer plantation. Some 71 species were recorded within the site during surveys, many of which are reliant on the upland (peat derived) habitats within the site, with the introduction of commercial forestry plantations facilitating the occurrence of more woodland/scrub species.

To inform the impact assessment at the proposed development a range of bird surveys were undertaken including a desk-based study and field surveys. The survey regime provides four seasons of ornithological data to inform the ornithological baseline for this proposed wind farm site and covers the following seasons:

Non-breeding season 2018-19:	October 2018 to March 2019
Breeding season2019:	March to August 2019
Non-breeding season 2019-20:	October 2019 to March 2020
Breeding season 2020:	March to August 2020

Accordingly, the ornithological surveying for Graffy Wind Farm provides two years of data in compliance with Scottish Natural Heritage (SNH, 2017) guidelines, which are the accepted basis for ornithological surveying and analysis.

This involved surveying ornithological study areas (500 m, 2 km and 6 km turbine buffers) in relation to the proposed turbine layout and associated site infrastructure and the proposed works

corridor from October 2018 to August 2020 inclusive, to provide four seasons of ornithological data.

Scottish Natural Heritage (SNH, 2017) provides recommended survey methodologies for the assessment of avian populations within and adjacent to proposed onshore wind farms. The survey methodologies utilised for the various field ornithological surveys adheres to the relevant SNH guidance and includes the following:-

- Vantage point watches to record flight-line activity through the 500 m turbine buffer to provide data on selected target species for assessing avian collision risk.
- Breeding bird surveys following an adapted Brown & Shepherd methodology for upland breeding birds and O'Brien & Smith (1992) for lowland breeding waders (snipe in particular) to provide information on the distribution of breeding birds throughout the proposed wind farm site..
- Breeding season wider area raptor surveys covering suitable habitat within 2 km of the proposed turbine locations for hen harrier, merlin, peregrine and other more common raptor species, and this was extended to cover suitable habitat within 6 km of the proposed turbine locations for breeding eagle.
- Breeding red-throated diver surveys, covering loughs within 2 km of the proposed turbine locations.
- Winter walkover surveys to provide information on the distribution of birds wintering throughout the site.
- Wider area winter waterbirds surveys, extending out to 5-6km from the proposed turbine locations.

Flight data for all target species was run through a collision risk model (CRM), as detailed by SNH (SNH, 2000 and Band *et al.*, 2007), employing avoidance rate as given in SNH(2010), SNH (2016) and SNH (2018), to provide estimates of the number of collisions per annum and for the opersational life of the project (30 years).

An impact assessment methodology was applied to the surveys, which allows for a structured and objective approach to assessing potential impacts on avian populations from proposed wind farm developments, as detailed in Percival (2003).

After characterising the potential impacts of the development and assessing the potential effects of these impacts on avi-fauna, mitigation measures are proposed to avoid and / or mitigate any identified ecological effects. Once measures to avoid and mitigate ecological effects had been

finalised, assessment of the residual impacts and effects was undertaken to determine the significance of their effects on avi-fauna.

In addition an assessment of cumulative impacts and effects was carried out, as cumulative effects can result from individually insignificant, but collectively significant actions, taking place over a period of time or concentrated in a location.

Over the course of the two-year ornithological study a total of 71 bird species were recorded. There were 33 species of birds recorded breeding within the 500 m turbine buffer and an additional 11 species recorded breeding within the 2 km turbine buffer. Species accounts were provided for Internationally Important species, including three Annex I Red listed species, (white-tailed eagle, golden eagle and golden plover), three Annex I Amber listed species (whooper swan, hen harrier and merlin) and one Annex I Green listed species (peregrine). Further species accounts for Nationally Important Red and Amber listed species are provided including wintering waterbirds, red grouse, sparrowhawk, kestrel, breeding waders, gull species and passerines.

The desk-based study and two years of ornithological surveys identified the following species as key ornithological receptors. Very high sensitivity (merlin), High sensitivity (white-tailed eagle, hen harrier and golden eagle), Medium sensitivity (whooper swan and red grouse), Low sensitivity (sparrowhawk, kestral, snipe, jack snipe).

The NIS for the proposed development (RPS, 2021) concludes that there will be no adverse effects, either individually or in combination with other plans or projects affecting the conservation interests or conservation objectives of the Special Protection Areas that were identified as within the potential zone of influence of the proposed development. This includes the pair of merlin breeding adjacent to the 500m turbine buffer, which are either close to or surpass the maximum territory size of 6 km reported for merlin. Therefore on the basis of spatial separation between the breeding site and the SPAs the identified pair of merlin is considered unlikely to comprise a part of the population of the Lough Nillan Bog SPA and does not form a part of the population within the Derryveagh and Glendowan Mountains SPA.

An interpretation of significance ratings based on Percivial (2003) was used to generate the levels of significance associated with potential impacts due to the proposed development. Effects were largly found to be *not significant*, although in the absese of mitigation effects of *very low* to *medium significance* were considered possible for species.

An assessment of potential effects on all the bird species was carried out, including impacts on a "Do Nothing" scenario, impacts during the construction phase, the operational phase and the

decommissioning phase of the development and finally cumulative impacts were also addressed.

The construction phase will result in a certain amount of inevitable impact, largely in the form of habitat alteration and disturbance, to facilitate construction of site access tracks, turbine bases, hardstand areas, sub-station and excavation for cabling to facilitate grid connection. In addition, there is potential for impacts upon ornithological features along the haul route where modifications to areas are required to facilitate the passage of large vehicles and components.

The potential impacts on birds during the operational phase can be due to disturbance and /or displacement from operational activities and servicing - though this would be limited to relatively few visits per year and would not be considered to add significantly to existing/background levels of human activity in the area and the operating turbines themselves and associated habitat loss.

Impacts associated with decommissioning are very much similar to those associated with the construction phase both in terms of duration, intensity and position. As with construction impacts the main concerns are likely to relate to disturbance during times when the species are most vulnerable, notably the breeding season.

The impacts on the avi-fauna, with mitigation and control measures in place, associated with the construction, operational and decommissioning phases of the proposal are largely considered to be *not significant*.

Assessed in the absence of control measures the exceptions to this include:

Inappropriately timed/phased construction works have the potential to result in direct disturbance to breeding:

- Merlin *medium significance*
- Meadow pipits *low significance*
- Sparrowhawk *low significance*
- Snipe *low significance*
- Amber listed passerines *low significance*

Inappropriately timed/phased construction works have the potential to result in indirect disturbance to breeding:

- Merlin *medium significance*
- Whinchat *low significance*
- Meadow pipits *low significance*
- Sparrowhawk *low significance*
- Snipe *low significance*

- Amber listed passerines *low significance*

The operational phase has the potential to result in direct (collision) impacts on foraging:

- White-tailed eagle *low significance*
- Golden eagle *low/medium significance*
- Kestrel *very low significance*

The operational phase has the potential to result in indirect disturbance to breeding:

- Merlin *medium significance*
- Whinchat *low significance*
- Snipe *very low significance*

Cumulative impacts on bird species are considered likely to be limited to the influence of other wind farms, together with the Graffy Wind Farm proposal, on displacement, collision or barrier impacts on birds. Given the current low density of operational and consented wind farms within 15 km of the proposal, there is not considered to be a risk of cumulative effects.

Mitigation

Mitigation approaches include mitigation by avoidance and mitigation by reduction and offsetting. Reference to embedded mitigations is also made and involving a reduction in the numbers of turbines and re-positioning of turbines and associated infrastructure, which avoids potentially sensitive avian receptors.

Any construction works proposed during the nesting bird season (March to August inclusive) will be preceded by a nesting bird survey and associated reporting. Works during the bird nesting season will be supervised on a weekly basis by an appropriately qualified ornithologist or Ecological Clerk of Works, engaged for the duration of the construction works.

Several enhancement measures will be implemented/agreed prior to the commencement of constructions works, including the provision of nesting baskets for merlin, nest boxes for kestrels and agreements with landowners to implement habitat management measures designed to protect and enhance breeding whinchat and snipe.

Measures to compensate for potential loss of foraging habitat for golden eagle or white-tailed eagle are not considered a requirement, as the proposed wind farm site is considered largely sub-optimal for golden eagle and only of interest to white-tailed eagles due the availability of carrion. However, as an enhancement measure, it is recommended that the wind farm company provide funding support to a red grouse conservation project in Co. Donegal or neighbouring county with potential to support breeding eagles. Funding would be targeted at undertaking

habitat enhancement measures for red grouse. An alternative location for provision of carrion could also be investigated.

The potential impacts on birds during the operational phase can be due to disturbance and/or displacement from operational activities and servicing (very minor) the operating turbines themselves (collision) and associated habitat loss. One of the main concerns during the operational phase of the project is potential mortality of white-tailed eagles and golden eagles due to collisions with turbines. Potential collision risk for merlin was addressed through embedded (design phase) mitigation, involving the re-locating of three turbines away from previous nest sites and by prohibiting erection of new fencing erected around wind farm infrastructure. In relation to limiting collision risk for the aforementioned species, the reduction from the originally consented 13 turbine wind farm in 2011 to the 8 turbines proposed in 2021 is considered as embedded mitigation in this regard.

Further mitigation by avoidance, was achieved by avoiding turbine placement in areas identified as attracting the most eagle flight activity. Baseline surveys have highlighted that there is limited suitable eagle nesting habitat within 2km of the proposed wind farm, and the main mitigation methods proposed to reduce potential collision/mortality largely relate to measures intended to reduce the attractiveness of the site for foraging eagles, such as ensuring rapid removal of fallen animals, controls on lambing and calving in proximity to turbine locations and the clearance of any fallen non-domestic animals, like deer and foxes.

Decommissioning phase impacts are likely to be broadly similar to construction phase impacts, in terms of disturbance through increased noise levels, ground clearance works, and reinstatement. The implementation of all mitigation measures detailed in the construction phase will help ensure that all such impacts are avoided.

Subject to implementation of the mitigation measures, the impacts on the avi-fauna associated with the construction, operational and decommissioning phases of the proposal are largely considered to be *not significant*, including those for golden eagle and breeding merlin, sparrowhawk, snipe, whinchat, meadow pipit and skylark. After mitigation, residual impacts of *very low* to *low significance* due to collsion risk remain for white-tailed eagle and kestrel.

Given the current low density of operational and consented wind farms within 15 km of the proposal, there is not considered to be a risk of cumulative effects.

Monitoring

Ornithological monitoring surveys will be carried out in the year prior to management actions being implemented, during the construction year and in post-construction years 1, 2, 3, 4, 5, 10 and 15. Pre-decommissioning ornithological surveys will also be required.

Statement of Significance

Analysis of the potential effects of collision risk and disturbance/displacement, with consideration given to proposed mitigation measures resulted in residual impacts that are considered of ***very low significance*** for white-tailed eagle and ***low significance*** **to** ***very low significance*** for kestrel. For all other avian species residual impacts are considered ***not significant.***

5.2.19.3 Bats:

Bats are protected by law in the Republic of Ireland under the Wildlife Act 1976 and subsequent amendments (2000 and 2010). Under the Wildlife Act, it is an offence to intentionally disturb, injure or kill a bat or disturb its resting place.

In order to undertake an assessment of the potential impact of the proposal on bats, it was necessary not only to carry out surveys to ascertain what bat species and numbers were present on the site, but also how susceptible those species were to impacts from wind turbines and how susceptible populations of the species occurring were to the impacts in an Irish context. Surveys consisted of walked transects and static monitoring detectors.

Baseline bat populations and habitat suitability at the site proposed for the wind park development were identified and an impact assessment was conducted. Pre-planning bat surveys were undertaken over 2019 and additional roost surveys in 2020 and 2021 to give an understanding of how bats utilise the area. Bat activity was recorded within the survey area [266m (200m + 66m rotor radius)], for a minimum of five species, including common pipistrelle, soprano pipistrelle, Leisler's bat, brown long-eared bat and *Myotis* species.

The levels of bat activity within the survey area for all species, all the deployment locations and across spring, summer and autumn seasons was categorised as ***low***. The bat species recorded utilising the development site are generally considered common and widespread in an Irish context and low levels of bat activity was recorded for all the species detected.

The potential direct impacts of the proposal on bats are considered, without mitigation, to be ***Significant*** at the ***Local*** scale (given that common species are more likely to occur within the rotor-swept area, albeit in low numbers).

Mitigation measures have been identified in the bat assessment for the following potential significant effects:

- Avoidance of potential direct impacts to a bat roost
- Avoidance of potential secondary impacts on bat foraging/ commuting habitat
- Avoidance of wind turbine collision or barotrauma events

It is considered that the mitigation measures, if implemented as recommended, will mitigate entirely for any potential impacts on foraging, commuting or roosting bats at the proposed wind park on Graffy Hill, and will result in an overall residual impact on bats that utilise the Application Site of ***negligible significance***.

The proposed Graffy Wind Park is located in an area that drains to two separate river catchments; the Stracashel River sub-catchment of the Owenea River, which flows to the west), the Stranagoppoge River sub-catchment of the River Finn, which flows to the east. This chapter assesses the effects of the proposed wind farm on fish stocks and habitats in the stream network both within the site boundary and in downstream watercourses directly connected to the site.

The fisheries and aquatic ecology assessment involved desktop review of relevant information/data, field surveys, data processing, analysis and interpretation. Current fisheries data and relevant conservation information on local rivers was assimilated and supplemented through site specific fisheries and ecological surveys of the proposed development covering the principal watercourses within and downstream of the planning application boundary. Field survey procedures consisted of walkover surveys of the principal watercourses, assessments of physical habitat conditions, measurement of basic chemistry parameters, collection of benthic invertebrate samples for assessment of biological quality and a fish stock survey by electrofishing. Potential effects were assessed for construction, operational and decommissioning phases of the development.

Of the ten key watercourses draining the area within the main wind turbine and access track boundary and downstream sensitive watercourses, the stream source of the Stranagoppoge river, was assessed at Very High sensitivity. Although the sections of the stream within the site boundary held only trout, the ecological quality was assessed at High, while juvenile salmon and the upper limit of the SAC occurred immediately below the site boundary.

One watercourse was assessed at High sensitivity since, although fish were absent due to the high gradient, the ecological quality was assessed at High. Five watercourses within the site boundary were assessed at Medium sensitivity because of the presence of trout or Moderate

ecological / physical habitat quality. The remaining three watercourses were assessed at Negligible or Low sensitivity due both to a lack of fish presence and poor/ very poor ecological or physical habitat quality.

Of the twenty site drainage watercourses intersecting the proposed cable route, three streams were of greatest sensitivity owing to a combination of having good/ excellent quality salmonid habitat, high potential to support trout, and the possibility of salmon presence. Six small watercourses were assessed as having Medium sensitivity at best because of the possible presence of trout, whereas the remaining small watercourses at sites were assessed at Low sensitivity due to habitat that was deemed unsuitable for salmonid fish, or Negligible sensitivity.

Of the seven site drainage watercourses surveyed at additional road widening areas, two streams were assessed as having Medium sensitivity at best, because of the possible presence of trout, whereas the remaining small were assessed at Low sensitivity, due to habitat that was deemed unsuitable for salmonid fish.

Of the five small non-designated watercourses intersecting and draining the area immediately downstream of the proposed new access road, four were assessed to have at best "Low" local sensitivity. One watercourse, draining the western end of the proposed new road, was assessed at "Medium" local sensitivity, because of the potential suitability of fair quality nursery habitat that may support small numbers of resident trout.

The proposed Graffy wind park development, including the proposed cable connection route, areas of road widening, and construction of a new access road, is located in the headwaters of two different river catchments (Ownea and Finn), both of which are significant, due to Atlantic salmon stocks and their occurrence within SACs and the Stacashel River also supports a population of freshwater pearl mussel (FPM).

The principal risk to fish and the aquatic environment in general will be during the construction phase of the proposed development. A series of specific mitigation measures have been designed to address, prevent and mitigate negative impacts on fisheries with regard to construction, operational and decommissioning phases of the project. Implementation of these measures will mitigate any significant effects relating to run-off of suspended sediments, release of pollutants, loss of habitat and obstruction of fish passage, thus ensuring that the overall significance of effects will be **Neutral** with regard to potential for impact to fish stocks and aquatic ecology of local rivers, in particular the Stracashel/ Owenea and the Stranagoppoge/ Finn, as the most sensitive receptors.

5.2.9.4 Aquatic Ecology

The proposed Graffy wind farm development, including the proposed cable connection route, areas of road widening, and construction of a new access road, is located in the headwaters of two different river catchments (Ownea and Finn), both of which are significant, due to Atlantic salmon stocks and their occurrence within SACs. The Stacashel River also supports a population of FPM. The principal risk to fish and the aquatic environment in general will be during the construction phase of the proposed development. Impacts on aquatic ecology and fisheries may be caused by:

- Loss of fish through pollution from the site during the construction phase;
- Loss of fish and aquatic flora and fauna or damage to aquatic habitats through run-off of suspended solids due to site construction works;
- Reduced productivity due to obstruction of fish passage or loss of habitat in watercourses.

Field survey procedures consisted of walkover surveys of the principal watercourses, assessments of physical habitat conditions, measurement of basic chemistry parameters, collection of benthic invertebrate samples for assessment of biological quality, and a fish stock survey by electrofishing. The principal consultees during the study were Inland Fisheries Ireland and the Loughs Agency, who were consulted with regard to the scope of the assessment and to provide data on fish stocks in relevant watercourses.

The study area focused on the watercourses draining the proposed site / planning application boundary, which are small tributaries of either the Stracashel River (Owenea) or Stranagoppoge River (Finn). Field survey work was carried out on these streams both within the planning application boundary and in potentially sensitive downstream reaches including the main Stracashel and Stranagoppoge rivers.

Fields surveys to determine baseline ecology and water quality of streams within and downstream of the main development site where the turbines and access routes are planned were conducted in November 2020 by sampling the benthic macroinvertebrate community and taking spot water samples. An outline assessment of the streams draining the proposed development site was carried out in September 2020 and consisted of walkover surveys recording general characteristics to provide an outline assessment for these watercourses. This was then complimented through a fish stock survey by electrofishing. Walkover surveys also were conducted in January 2021 to record salmonid habitat characteristics of streams

intersecting the proposed cable connection route. The Fisheries Sensitivity of the key watercourses intersecting the cable route, the areas of proposed road widening and the new access road through Coillte land, and downstream sensitive watercourses, were assessed using information collated in a walkover assessment of salmonid habitat, general physical habitat, and summer 2021 fish surveys.

Potential effects on aquatic ecology were assessed for construction, operational and decommissioning phases of the development.

The Hydrology chapter in the EIAR, outlines a series of measures to be implemented with regard to the control and attenuation of surface water run-off including a full drainage design during the construction stage. These measures will prevent the run-off of excess sediments to connected rivers, in particular the Stranagoppoge and Stracashel Rivers, via the streams directly draining the site. With the recommended mitigation measures in place the probability of residual impacts from run-off of suspended solids will be Unlikely with an impact on the quality of fish, their habitat and aquatic ecology of Neutral.

Post-construction (operational) effects include habitat loss at watercourse crossings, obstruction of fish passage, and surface water run-off. The potential for any impacts will be significantly reduced during the operational phase with the construction process complete, site infrastructure in place, and a reduced requirement for any hazardous materials on-site. Similarly, the cable connection will be in place and no direct crossing of watercourses will have occurred so that the potential for impacts will be very unlikely.

No tributaries within the turbine and access track area had either habitat suitable for salmonids or fish presence and so no impact is expected.

With the recommended mitigation measures in place the probability that the proposed cable installation will result in long-term obstruction of fish passage is deemed Unlikely and the residual impacts in this respect will be Neutral.

The impacts of decommissioning are likely to be similar to those of construction although probably of lower magnitude, as it is unlikely that any of the structures at or near to primary watercourses will be removed or modified in any way.

No other existing or proposed developments occur within the locality of the current proposed development, and so there is no potential for significant cumulative effects.

In conclusion, a series of specific mitigation measures have been designed to address, prevent and mitigate negative impacts on fisheries with regard to construction, operational and decommissioning phases of the project. Implementation of these measures will mitigate any

significant effects relating to run-off of suspended sediments, release of pollutants, loss of habitat and obstruction of fish passage, thus ensuring that the overall significance of effects will be Neutral with regard to potential for impact to fish stocks and aquatic ecology of local rivers, in particular the Stracashel/ Owenea, several Stracashel River tributary intersections with the cable route connection, and the Stranagoppoge/ Finn, as the most sensitive receptors.

5.2.9.5 Freshwater Pearl Mussel:

The proposed Graffy wind Park development, including the proposed cable connection route, areas of road widening, and construction of a new access road, are located in the headwaters of two different and significant river catchments (Owenea and Finn). The significance of the River Finn is due to Atlantic salmon stocks and their occurrence within SACs and an extant population of freshwater pearl mussel. However the most recent comprehensive surveys could not find any pearl mussels.

The Stracashel River, a tributary of the Owenea and the Owenea itself support populations of FPM. The principal risk to freshwater pearl mussel in general will be during the construction phase of the proposed development with the risk associated with fine sediment loading to the receiving watercourses which in the upper reaches of these catchments and the potential for alterations in the flow regime.

A series of specific mitigation measures have been designed to address, prevent and mitigate negative impacts on freshwater pearl mussel with regard to construction, operational and decommissioning phases of the project. Implementation of these measures will mitigate any significant effects relating to run-off of suspended sediments, release of pollutants, deterioration of habitat, thus ensuring that the overall significance of effects will be negligible with regard to potential for impact to aquatic ecology of local rivers.

5.2.10 MATERIAL ASSETS:

5.2.10.1 Material assets are described in the EPA guidelines as '*resources that are valued and that are intrinsic to specific places are called 'material assets'. They may be of either human or natural origin and the value may arise for either economic or cultural reasons. Examples of natural resources of economic value include assimilative capacity of air and water, non-renewable resources (e.g. minerals, soils, quarries and mines), renewable resources (hydraulic head, wind exposure).*

5.2.10.2 Many of the aspects of material assets are addressed in other chapters of the EIAR and this chapter describes the material assets associated with the site and its environs, the potential impacts of the proposed development thereon and the proposed mitigation measures to avoid or reduce potential impacts. It assesses the cumulative impact on material assets of the proposed turbines with the other permitted and operational wind farms in the area, as well as the proposed grid connection.

5.2.10.3 Wind energy is a natural resource and has the following attributes:-

- It is the country's biggest energy resource.
- It is clean, renewable and sustainable as a means of electricity generation.
- It is a cost-effective energy options for reducing global warming.
- The operation of a wind farm has practically zero emissions.

5.2.10.4 The site of the proposed development is located in an area suitable for wind farm development, as it is an exposed area with good predicted wind speeds. It is considered that the site area can accommodate eight turbines, as demonstrated by the previously permitted development and can contribute an additional 35.88 MW of renewable energy generation to the national grid. Government targets for electricity generation from renewables require an additional 3,900MW of installed wind farm capacity. Having local embedded generation capacity is a benefit to the electricity transmission and distribution networks, as there are less losses associated with local embedded generation, since the power generated is largely consumed locally.

5.2.10.5 While commercial forestry constitutes a local resource adjacent to the site, forestry resources will only be minimally affected by keyhole felling. Felling will be required at a new access route adjacent to local road L-6733 to the northeast of the wind farm, easement of bends along the delivery route, bat impact mitigation around T1, T4, T5 and T6, at the turbine track to T1 and between T4 and T5/T6. Felling of approximately 6.656 ha of forestry in total will be required and compensatory replanting will be carried out at a site in County Mayo.

5.2.10.6 In terms of an agricultural resource, land use in the area consists primarily of low intensity agriculture and forestry and parts of the site are used for rough grazing of sheep. Conifer plantations are widespread in the area, with forestry within the central part of the site and adjacent to the eastern site boundary. There is evidence of small-scale historic turf cutting at the site with active turf cutting still occurring in the general area, particularly at the low-lying elevations. Parts of the site are used for rough grazing of sheep. The agricultural activity in the area can continue following the construction of the wind park.

5.2.10.7 According to the Directory of Active Quarries, Pits and Mines in Ireland, there are no pits or mines in the vicinity of the site. Overburden is expected to be deep at the site, so potential for rock extraction is very low. The overburden is gravelly in places, but with a high clay content. While suitable for bog road construction, it has low potential for commercial gravel extraction. The development of the wind farm will have positive and negative impacts upon the material assets in the receiving environment.

5.2.10.8 From a positive viewpoint, in addition to reducing harmful atmospheric emissions, wind energy is an indigenous, secure and sustainable resource in contrast to fossil fuels, which are ultimately unsustainable. Current rates of use of fossil fuels (coal, oil and gas) are 300,000 times greater than the rate at which these fuels are naturally created. The development of wind energy slows down this depletion and offers an alternative power source. The wind park will make effective use of an exposed site, which has a low usage intensity and the local climatic conditions are very suitable for such development. The local wind resource can be considered a material asset, which will now be utilised. Finally, the development of wind energy projects in rural areas provides an increased income for landowners, as the utilisation of their land can be diversified.

5.2.10.9 A potential negative impact relates to tourism. The area in which the wind park is proposed, is designated as an area of High Scenic Amenity in the Donegal CDP 2018-24. While acknowledging the socio-econimic advantages of tourism, the area is not an important area for tourists. Tourist attractions in the vicinity of the site include the Wild Atlantic Way (WAW), although the WAW route is over 10kms to the west at its closest point at Lettermacaward and generally hugs the western seaboard of Donegal. The wind park is not visible from Lettermcaward, but long distance views of the wind park will be seen from short sections of the WAW over 17kms from the site.

Apart from the WAW, there are no designated scenic roads in the vicinity of the wind park site and no designated views or prospects overlook the site. The Sli na Finne a 42m section of the Sli Dhun na nGall, passes close to the site to the east and north.

Wind turbines can be considered to be an environmentally benign approach to energy generation or alternatively as an unwelcome intrusion on the landscape. To date there has been no evidence to suggest that the limited tourism in an area may be negatively affected by the presence of a wind energy facility.

5.2.10.10 The proposed grid connection route from the substation at Meenagrubby to Tievebrack Eirgrid station is approximately 7.5km long and will be underground. Accordingly, it will have no impact on material assets during the operational phase of the wind farm. Construction of the

grid along public roads will have a temporary negative impact on the local road network, with some short-term traffic disruptions expected.

5.2.10.11 Wind energy is one of Ireland's largest, commercially viable energy resources, and is also a clean, renewable, and sustainable means of electricity generation. The proposed wind farm will increase the electricity resource, without compromising other natural resources in the area. The overall impact of the wind farm on the material assets of the area is therefore positive and no mitigation measures are required.

5.2.11 ELECTRO-MAGNETIC EFFECTS:

5.2.11.1 The rotating blades of a wind turbine may occasionally cause interference to electro-magnetically-propagated signals. An assessment was carried out of impacts of the Graffy Wind Park on local telecommunication systems, including TV, radio and mobile communication. In addition, the potential impact of wind parks on the operations of IAA (Irish Aviation Authority) radar installations was appraised.

5.2.11.2 Electromagnetic Interference (EMI) can arise from a number of sources associated with wind parks, such as construction tools, interference emanating from turbines, signal scattering from the obstruction presented by the turbine blades and signal obstruction as it passes through the area swept by the rotating blades.

5.2.11.3 The electromagnetic emissions from power tools and/or generators are common as these tools are in wide use at building sites throughout the country and it is therefore not anticipated that there will be interference from these sources during construction.

5.2.11.4 A wind turbine will generate electromagnetic energy that will be propagated in the vicinity of the machine. Wind turbines are required to be tested prior to sale, which ensures that it meets the required European standard with regard to level of emissions (EN 55011) and immunity to interference (EN 61000). Accordingly, electromagnetic interference is not expected to be a problem.

5.2.11.5 Large wind turbines can act as sources of re-radiation. They produce delayed 'ghost' signals that are altered in amplitude by the rotation of the blades. The amplitude of the re-radiated signals is greatest when the plane in which the blades rotate is orientated so that the angle of incidence, and reflection are equal. This is called the 'specular reflection' condition. Specular reflection may occur for some proportion of the time, as the blade of the wind turbine will turn into the wind about a vertical axis.

5.2.11.6 Wind turbines can obstruct the path of and therefore reduce the strength of signals. This obstruction occurs when the turbine turns through 90° as a result of the specular reflection condition. This effect is less significant than the generation of delayed signals that cause picture degradation. This effect needs to be avoided in the case of point-to-point networks.

5.2.11.7 Digital terrestrial TV (Saorview) has replaced analogue transmissions since 2012, which has mitigated TV reception interference from turbines. Mobile phone communications masts are not transmitting through the site.

5.2.11.8 A number of communication providers were consulted to determine whether the proposed wind park would impact on their signals. The providers who responded raised no objection to the project. Tetra Ireland, a provider appointed by the Irish Government in 2006 to build and operate a National Digital Radio Service (NDRS) and which had no objection provides a telecommunications service to the An Garda Siochana, Irish Coast Guard, Mountain Rescue Ireland, BT, Civil Defence, Eir, IAA, HSE National Ambulance Service, Air Corps and the RNLI.

5.2.11.9 No cumulative impacts are envisaged between the proposed wind park and the operational and proposed wind parks within 15kms nor are there any cumulative impacts envisaged between the wind park and the grid connection to Tievebrack substation.

No mitigation measures are required in relation to electro-magnetic radiation from the turbines, as levels are negligible.

6.0 INTERACTION OF THE ENVIRONMENTAL TOPICS.

The interactions of all the environmental factors indicate an overall positive development capable of providing a clean, renewable and sustainable energy source for the region.

The main impacts have been discussed in their respective chapters in the EIAR and appropriate remedial measures presented where necessary. The construction of the wind park will have no significant additional impact on the environment over those predicted for the previously permitted wind park at Graffy, which this development would replace if granted planning permission.

The overall conclusion of this EIAR is that the site is suitable for the proposed development and that the use of a larger turbine (over that permitted) will provide greater benefits in terms of maximising the energy yield of the site.