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ENVIRONMENTAL IMPACT ASSESSMENT REPORT (EIAR) FOR THE PROPOSED DERRYNADARRAGH WIND FARM, CO. KILDARE, OFFALY & LAOIS

Volume II – Main EIAR

Chapter 17 – Material Assets, Telecommunications and Aviation

Prepared for:

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17. MATERIAL ASSETS, TELECOMMUNICATION AND AVIATION

17.1 Introduction

This chapter assesses the likely significant effects of the proposed Project on Material Assets and Utility Infrastructure, Telecommunications and Broadcasting and Aviation that might potentially be affected by the Proposed Development. The potential effects of the Proposed Development at Derrynadarragh are initially considered without mitigation and the residual effects post mitigation are described. The assessment considers the potential effects during all phases of the development: construction, operation and decommissioning. This chapter assesses:

- Material Assets and Utilities (Gas, Water, Electricity Cables etc.);
- Telecommunications & Broadcasting;
- Aviation.

A comprehensive description of the Proposed Development assessed in this EIAR is provided in Chapter 2 - Development Description and comprises the following elements:

- The 'Proposed Wind Farm' (also referred to in this EIAR as the 'Proposed Development');
- The 'Proposed Grid Connection' (also referred to in this EIAR as the 'GC');
- The 'Turbine Delivery Route' (also referred to in this EIAR as the 'TDR');
- The 'Biodiversity Enhancement Management Plan Lands' (also referred to in this EIAR as the 'BEMP Lands');

An overview of the Proposed Development, including BEMP lands, at Derrynadarragh is shown in Figure 2.2a and 2.2b of Volume IV of this EIAR and covered within Chapter 2 - Description of the Proposed Development (Volume II), which also include the general layouts of the Proposed Wind Farm, Grid Connection, Turbine Delivery Route, which are presented in Figures 2.3 to 2.4. The final choice of make and model of the turbine that will be developed at the Proposed Development will be dictated by a competitive tender process of the various turbines on the market at the time and the turbine will be in accordance with Chapter 2 Description of Proposed Development, Volume II of this EIAR.

The turbine model will be a conventional three-blade horizontal axis turbine. Schematic drawings of the design parameters accompany the planning application. The plans and particulars are precise and provide specific dimensions for the turbine structures which have been used in this assessment. The Proposed Wind Farm consists of the erection of 9 of these turbines, with the following key specifications:

- 4 no. turbines will have a tip height of 186m above existing ground level with a hub height of 105m and rotor diameter of 162m, and
- 5 no. turbines will have a tip height of 187m above existing ground level with a hub heigh of 106m and rotor diameter of 162m.

17.2 Statement of Authority

This chapter has been prepared by Eoghan O'Sullivan and reviewed by Jim Hughes, all of Fehily Timoney and Company. Please refer to Appendix 1.2, Volume III of this EIAR, for relevant CV's of the Authors.

Eoghan O'Sullivan is a Senior Project Engineer with a BEng in Civil Engineering from University College Cork. Eoghan has experience working on various renewable energy projects preparing chapters of the EIAR for wind and solar farms including traffic and transport, air and climate, telecommunications and aviation chapters.

Jim Hughes (BA Public Administration, EIA/SEA Dip, MSc Town Planning), is Director of the Energy and Planning department at Fehily Timoney and Company. Jim is a professional Town Planner with almost 20 years' experience in managing large complex infrastructure projects. Jim has extensive Strategic Infrastructure Development (SID) experience being Project Director / Project Manager for the submission of numerous SID Wind Farm Projects and the submission of multiple no. SID applications for onshore electrical infrastructure under Section 182 of the P&D Act.

17.3 Methodology

This chapter of the EIAR assessment describes the methodology used in assessing the potential effects from the Proposed Development, and, as such, has considered Material Assets and Utilities, Telecommunications and Broadcasting and Aviation as stand alone sections within this EIAR chapter, with this chapter compiled in line with Consultation and Methodology and Relevant Policy and Guidance, as outlined below.

Material assets, as defined in EPA (2022) 'Guidelines on the information to be contained in Environmental Impact Assessment Reports' refer to built services, roads and traffic and waste management.

In alignment with the principles of the Circular Economy, this project will prioritise the prevention and minimisation of waste, as demonstrated across all relevant chapters, including soil, waste, and the Construction Environmental Management Plan (CEMP). Excess materials generated during site activities will, where feasible, be treated as by-products rather than waste, in accordance with Article 27 of the European Union (Waste Directive) Regulations 2011 (as amended). EPA Guidance on the Waste Framework Directive confirms that uncontaminated soil and stone that is certain to be used in construction at the same project site from where it was excavated is not regulated as waste[1]. The EPA 'Guidance on Soil and Stone By-products in the context of Article 27 of the European Communities (Waste Directive) Regulations 2011 (Version 3, published June 2019)' This approach ensures that materials removed off-site are reused whenever possible, supporting sustainable resource management. The Circular Economy and Miscellaneous Provisions Act 2022 further reinforces the requirement to treat excavated soil and material as non-waste by-products, provided they meet the necessary criteria. Where reuse is not feasible, materials will be recycled or otherwise managed responsibly. Additionally, any materials containing invasive species will be appropriately handled and transported to authorised facilities. The potential future use of Article 28 notified materials, which meet end-of-waste criteria, will also be considered, subject to timely decisions from the Environmental Protection Agency (EPA). Please refer to accompanying Chapter 11 – Soils, Geology, and Hydrogeology for further details.

The potential for the Proposed Development to impact roads and traffic is addressed in Chapter 14 - Traffic & Transportation. Potential for effects on land use is addressed in Chapter 6 - Population and Human Health and Chapter 11 - Soils, Geology and Hydrogeology. Assets of Archaeological, Architectural and Cultural Heritage are considered in Chapter 15 of this EIAR.

[1] Guidance_on_Soil_and_Stone_By_Product.pdf (epa.ie)

17.3.1 Relevant Policy and Guidance

A review of relevant policy and guidance documents was undertaken to identify relevant objectives relating to utility services, telecommunication, broadcasting and aviation and included:

- 'Wind Energy Development Planning Guidelines' (WEG2006), published by the Department of the Environment, Heritage and Local Government (2006).
- 'Best Practice Guidelines for the Irish Wind Energy Industry', published by the Irish Wind Energy Association (2012).
- 'Tall structures and their impact on broadcast and other wireless services', published by Ofcom, a regulatory body independent from UK Government (2009).
- 'RF Measurement Assessment of Potential Wind Farm Interference to Fixed Links and Scanning Telemetry Devices', published by ERA Technology Ltd on behalf of Ofcom (2009).
- Kildare County Development Plan 2023 – 2029.
- Offaly County Development Plan 2021 – 2027.Laois County Development Plan 2021 – 2017.

17.3.2 Material Assets - Utility Infrastructure

In the context of wind farm development and utility infrastructure associated with the Proposed Development, all relevant stakeholders such as EirGrid, ESB Networks, Gas Networks Ireland (GNI) and Uisce Éireann etc. have been consulted regarding the Proposed Development. All Private / State utility companies will be contacted to verify the existence of services prior to any construction taking place.

17.3.3 Telecommunication and Broadcast Electromagnetic Interference

This section describes the methodology used in assessing the potential effects from the Proposed Development on telecommunications and broadcasting. The potential effects from wind farm developments on telecommunications and broadcasting are considered in this chapter, following a Telecommunications Impact Study (Appendix 17.1) and Irish Rail Telecommunication Impact Study (Appendix 17.2) conducted by AiBridges, enclosed at Volume III of this EIAR. The methodology utilised by AiBridges included Telecom Operator Consultations, Field Surveys and Desktop Survey Network Modelling and Analysis.

Electromagnetic interference from the wind farm on existing telecommunication services can result in an unacceptable negative effect. The rotating blades of a wind turbine can occasionally cause interference to electro-magnetically propagated signals.

Not all signals are affected in the same way and some signals are more robust than others, however, such interference could, in theory, affect all forms of electromagnetic communications including:

- Satellite communications ;
- RADAR;
- Cellular radio communications ;
- Aircraft instrument landing systems;
- Air traffic control;
- Terrestrial telecommunication links;
- Television broadcasts.

For the purposes of the telecommunications impact assessment, compiled by AI Bridges (refer to Appendix 17.1 of Volume III of this EIAR), point-to-point and point-to-multipoint signals are considered. Both are used extensively throughout Ireland. Point to point (or line of sight) is a wireless telecommunications transmission link between two nodes located at specified fixed points.

The term telecommunications link relates to the wireless transmission of data via radio frequencies between two fixed points. Telecommunications towers are generally used to transmit and receive signals over large distances. Radio frequency bands above 1 GHz are referred to as microwave radio links and are commonly used by telecommunications operators. These links are used mainly by mobile phone operators, broadcasters and utilities or emergency service providers, to provide transmission networks that are flexible and cost effective.

Point to multipoint refers to the situation where a central node transmits to, and receives from, a number of independent locations. This includes television and radio broadcasting and reception, mobile phones (to the mobile phone mast) and land mobile systems. It is possible that houses in the immediate vicinity of turbines could require some remedial measures in relation to television reception.

Wind turbines as with any other large structure, have the potential to interfere with broadcast signals by acting as a physical barrier or causing a degree of interference to microwave links. The most significant effect at a domestic level relates to a possible flicker effect caused by the moving rotor, affecting, for example, radio signals. The most significant potential effect occurs where the wind farm is directly in line with the transmitter radio path. Interferences to mobile radio services is usually negligible, especially with increased distance between turbines and receivers.

Depending on local topography, a domestic receiver may receive broadcast signals from more than one location. The strength of the signals varies with distance from the transmitter, and the receiver's antenna is generally always directed towards the most local, and usually strongest, broadcasting station.

There are two types of potential electromagnetic interference to domestic receivers, depending on the location of the receiver in relation to a wind farm. '*Shadowed*' houses are located directly behind a wind farm, relative to the location from where the signal is being received. In this case, the main signal passes through the wind farm and the rotating blades can create a degree of signal scattering.

In the case of viewers located beside the wind farm (relative to the broadcast signal direction), the effects are likely to be due to periodic reflections from the blade, giving rise to a delayed signal. In both cases, i.e. shadowed houses located behind the wind farm and those located to the side of it, the effects of electromagnetic interference may depend to some degree on the wind direction, since the plane of rotation of the rotor will affect both the line-of-sight blockage to viewers located behind the wind farm and the degree of reflection to receivers located to the side.

17.3.4 Aviation

To assess the potential effects of the Proposed Development on aviation, AiBridges compiled an aviation review, presented within the accompanying Cloonkett Wind Farm Aviation Review Statement, contained within Appendix 16-2 of Volume III of this EIAR.

The methodology used by AiBridges within the Cloonkett Wind Farm Aviation Review Statement involved an assessment and consideration of the following to identify potential interactions, and recommended mitigations and determined the likely residual effects;

- Annex 14 – Obstacle Limitation Surfaces (OLS);
- Annex 15 – Aerodrome Surfaces;

- Building Restricted Areas (BRA);
- Minimum Sector Altitudes (MSA);
- Instrument Flight Procedures;
- Permitted Wind Farms in vicinity of Proposed Wind Farm;
- Communications, Navigation and Radar Surveillance Systems Safeguarding;
- Flight Inspection and Calibration;
- Aeronautical Obstacle Warning Light Scheme;
- Irish Air Corps / Department of Defence Safeguarding; and
- Garda Air Support Unit (GASU) and Emergency Aeromedical Service (EAS).

Wind turbines have the potential to affect other signal types used for communication and navigational systems, for example tower-to-tower microwave communication links, and airborne and ground radar systems. Interference with radar systems occurs when wind turbines are located close to an airport or directly in line with the instrument landing approach. As described within the '*Derrynadarragh Wind Farm Aviation Review Statement*', as conducted by AI Bridges, the nearest such operational airport to the Proposed Development is Dublin Airport, which is over 60km away to the northeast. The private Clonbullogue Airfield is located 5km north of the Proposed Development. Furthermore, as show

With regards to telecommunications and broadcast communications, any potential effects on broadcast communications are generally easily dealt with by detailed micro-siting of turbines in order to avoid alignment with signal paths, or by the use of repeater relay link, (i.e. reflective and or refractive panels).

17.3.5 Scoping and Consultation

Scoping and consultation have been carried out in support of the proposed Project and in line with the EIA Directive, together with regard to the EPA Guidelines and the European Commission's guidance on the preparation of EIARs.

Section 5.10 of the DoEHLG Planning Guidelines on Wind Energy Developments (2006) states that:

> *"wind turbines, like all electrical equipment, produce electromagnetic radiation, and this can interfere with broadcast communications. The interference with broadcast communication can be overcome by the installation of deflectors or repeaters. Planning authorities should advise the developer to contact the individual broadcasters, both national and local, and inform them of the proposals. A list of the licensed operators is available on the ComReg website at www.comreg.ie. Mobile phone operators should also be advised of the proposed development."*

Section 7.15 of DoEHLG Planning Guidelines on Wind Energy Developments (2006) states:

> *"Conditions regarding measures to be taken to minimise interference with the transmission of radio and television signals, air and sea transport communications and other transmissions systems in the area may be necessary. Where electromagnetic interference is difficult to predict, conditions may require the developer to consult with the service provider concerned and undertake remedial works to rectify any interference caused."*

Telecommunications operators (as well as aviation and utility providers) that could potentially be affected by the Proposed Development were identified through field and desktop surveys and consultation with national operators.

Initially, a desktop examination of resources and infrastructure was conducted in the area of the Proposed Development site, GCR and TDR. This desktop study provided initial constraints for analysis and also identified potential stakeholders for consultation.

As part of the EIAR scoping and consultation exercise relevant utility, resource and telecommunication operators and aviation authorities were consulted. Scoping was carried out in accordance with the EPA Guidelines[2] and the '*Best Practice Guidelines for the Irish Wind Energy Industry 2012*[3] which provides a recommended list of stakeholders for consultation, in addition to updated lists of stakeholders provided by the '*Commission for Communications Regulation and the Irish Aviation Authority*' through consultation.

The following assessment methodology was applied:

- Wide ranging consultation with all known utility and telecommunications operators that could potentially be affected by the Proposed Development (see Chapter 5 EIA Scoping and Consultation);
- Consultation with authorities such as the Irish Aviation Authority, Air Navigation Ireland, Dublin Airport Authority and Irish Air Corps;
- Comprehensive data gathering exercise to establish all known telecommunications links and utility infrastructure in the area;
- Preparation of constraint mapping using data collected from the operators, to identify separation distance of elements of the Proposed Development from existing infrastructure and if necessary, identify mitigation measures;
- Identification of aerodromes and airports in proximity to the Proposed Development, and any associated infrastructure;
- Review of turbine delivery route in the context of overhead power and telecommunication lines;
- Review in relation to underground utility infrastructure.

As outlined within EIAR Chapter 5 - EIA Scoping and Consultation, extensive searches of existing material assets and utility services were carried out using a network analysis tool, stakeholder consultation and fieldwork to identify areas where major assets exist such as high voltage electricity cables or gas mains were located. A full description of the scoping and consultation responses received are set out in Appendix 5.2 of Volume III of this EIAR, and within EIAR Chapter 5 - EIA Scoping and Consultation.

Relevant aviation authorities were consulted as part of the EIAR scoping and consultation exercise. Scoping was carried out in accordance with EPA Guidelines and the 'Best Practice Guidelines for the Irish Wind Energy Industry 2012 which provides a recommended list of aviation stakeholders for consultation. An updated list of stakeholders was developed through consultation with the Commission for Communications Regulation and the Irish Aviation Authority.

[2] EPA, (2022) 'Guidelines on the Information to be Contained in Environmental Impact Assessment Reports'

[3] IWEA. (2012). Best Practice Guidelines for the Irish Wind Energy Industry.

17.4 Receiving Environment

17.4.1 Material Assets and Utilities

As part of the scoping and consultation process for the Proposed Development, and as detailed within EIAR Chapter 5 - EIA Scoping and Consultation, searches of existing utility services were carried out using a network analysis tool, stakeholder consultation and fieldwork to identify areas where major assets exist such as high voltage electricity cables or gas mains. Private / State utility companies such as Eirgrid, Uisce Éireann (formerly Irish Water), ESB Networks (ESBN) and Gas Networks Ireland (GNI) were also consulted during this period, and will be contacted to verify the existence of services prior to any construction works taking place.

17.4.2 Telecommunication and Broadcasting

Consultations were also carried out with telecommunication and broadcasting stakeholders including authorities with associated telecommunication infrastructure, wireless broadcasters, cellular network providers, broadband suppliers and wireless internet service providers (WISP). The Imagine Broadband Network and Three Ireland responded that they both have microwave links in the vicinity of the site that may be affected by the Proposed Development. AI Bridges was commissioned to evaluate the possible impacts that the proposed wind farm at Derrynadarragh, on the Kildare-Offaly border could have on existing telecommunications operator networks. Please refer to the accompanying Appendix 17.1 - Telecommunications Impact Study (Volume III of this EIAR) for further details of this assessment.

During Telecom Operator Consultations in February 2025, Irish Rail (IR) were contacted to determine if they had any concerns in relation to the proposed wind farm at Derrynadarragh, on the Offaly-Kildare border. In the respond received from Irish Rail, it was stated that they operate a GSM-R Train Radio communications system in the vicinity of Derrynadarragh. Irish Rail also requested a 5km Exclusion Zone around their transmitting radio antennas.

AI Bridges Ltd were subsequently commissioned to evaluate the Irish Rail communications network and to assess the possible impacts that the proposed wind farm at Derrynadarragh could have on the Irish Rail radio network. Field and desktop surveys of the Irish Rail network in the vicinity of Derrynadarragh were carried for the telecommunications assessment. Please refer to the accompanying Appendix 17.2 - Irish Rail Telecommunications Impact Study (Volume III) for further details in relation to this assessment.

17.4.3 Aviation

In relation to aviation, consultations were carried out with Irish Aviation Authority, Air Navigation (AirNav) Ireland and the Irish Air Corps, and a copy of AI Bridges' Aviation Review Statement was provided for review. Please refer to Appendix 17.3, Volume III of this EIAR, for AI Bridges' Aviation Review Statement and further details.

The Irish Aviation Authority responded 'The proposed wind farm is proximate to the licenced Aerodrome – Clonbullogue Co. Offaly. Please engage directly with the aerodrome licensee, Irish Parachute Club to make them aware of the Derrynadarragh Wind Farm proposal'.

17.5 Assessment of Likely Significant Effects

17.5.1 Do- Nothing Scenario

If the Proposed Development at Derrynadarragh were not to proceed, there would be no change to the existing Material Assets - Utility Infrastructure, Telecommunications and Broadcasting or Aviation operations in the area. If the Proposed Development does not proceed, the opportunity to capture an available renewable energy resource at Derrynadarragh and County Kildare would not be availed of, and in turn, the opportunity would be lost for the Proposed Development to contribute to meeting national and EU targets in reducing greenhouse gas emissions – full policy details are outlined and assessed in Chapter 4 of this EIAR Construction Phase Effects

17.5.2 Construction Phase Effects

17.5.2.1 Material Assets - Utility Infrastructure

Scoping and consultation responses received relevant to Material Assets and Utilities are shown below in Table 17-1: Material Assets and Utilities Scoping and Consultation Responses Received. The table outlines the utility provider contacted, the date a response was received and the response received. A full description of the scoping and consultation responses are contained within Chapter 5: EIA Scoping and Consultation, and set out in Appendix 5.2 of Volume III of this EIAR.

Table 17-1: Material Assets and Utilities Scoping and Consultation Responses Received

Utility Provider	Date Received	Responses Received
Eirgrid	12/12/2024	In the interests of expediency of applications, and due to reduced resources, it is EirGrid policy not to comment on EIAR Scoping Reports.
ESB Networks	n/a	No response received
Gas Networks Ireland (GNI)	n/a	No response received
Uisce Éireann	n/a	No response received

As outlined above, ESB Networks (ESBN), Gas Networks Ireland, Uisce Éireann (formerly Irish Water) provided no feedback, Eirgrid did not provide any technical comment on the scoping report.

There are no Gas Networks Ireland (GNI) gas transmission lines, or Uisce Éireann mains water lines identified within the Wind Fram site boundary.

An onsite electricity substation will be constructed within the Proposed Development site to provide a connection point between the wind farm and the national grid via an underground cable grid connection to the existing 110kV Bracklone substation. The proposed grid connection cable works will include trenching, laying of ducting, installing 15 no. joint bays and 7 no. watercourse crossings, pulling cables and the back filling of trenches and reinstatement works, within the townlands of Cushina in County Offaly; Aughrim and Derrylea in County Kildare, and Inchacooly, Coolnaferagh, Ullard or Controversyland, Clonanny, Lea, Loughmansland Glebe, and Bracklone in County Laois. The underground cabling will traverse the following roads; L70481 (; Derrylea Road); L71764; L7050; L-7051; L7176; L71761; R424; and R420 (Lea Road).There will be a likely short-term disruption to water services during construction of the 110KV underground cable, there is sufficient width across the road curtilage to accommodate the underground cable and the water supply. as per Planning Drawings Danu DAR D002.series of cross sections showing water supply and the 110Kv underground cable.

As described within EIAR Chapter 14 - Traffic and Transportation, most loads associated with this Proposed Development are of standard size and can navigate the national road network without transport issues. Accommodation works for the delivery of turbine components from Galway Port to Proposed Development site are required. These works include hedge or tree cutting, removal of wall sections, street furniture, vegetation, fences, temporary culverting of ditches and stream crossings, relocation of powerlines and support pole sets, lampposts, signage and temporary local road widening through the laying of compacted load bearing aggregate to verges and roundabouts.

Pre-planning discussion on the TDR have taken place with Kildare, Offaly and Laois County Council's Roads Departments, with any potential impact on road infrastructure is detailed in Chapter 14: Traffic & Transportation. Effects on the overhead utilities associated with the TDR as a result of deliveries of infrastructure components is only associated with the construction process. The TDR will be confined to the public road corridor except for locations where temporary accommodation works will be required to facilitate the delivery of abnormal loads. A Traffic Management Plan (TMP) will be in place for the duration of the works, please refer to Appendix 14.1, Volume III of this EIAR.

This would result in a brief slight negative impact on utilities along the TDR.

17.5.2.2 Telecommunications and Broadcasting

The potential for interference to telecommunications and broadcasting during the construction phase of the Proposed Development have been assessed by AiBridges. There are 4 no. radio links/radio network that cross over/near the proposed wind farm site.

Operator	Radio Link	Impact of Wind Farm
Imagine Broadband	PTP microwave radio link from Dunmurry Hill to Gracefield GAA (Link #1)	No impacts
Imagine Broadband	PTP microwave radio link from Dunmurry Hill to Gracefield GAA (Link #2)	No impacts
Three Ireland	PTP microwave radio link from Clonyquin to Rathangan	No impacts
CIE	GSM-R network along CIE rail track between Kildare Town and Portarlington.	Subject to further detailed GSM-R technical assessment.

The Ai Bridges assessment confirms that there is no potential electromagnetic interference effects associated with the construction phase of the Proposed Development on the Imagine Broadband or Three Ireland radio link.

Following consultation with Irish Rail Ai Bridges were subsequently commissioned by the applicant to evaluate the Irish Rail communications network and to assess the possible impacts that the proposed wind farm at Derrynadarragh could have on the Irish Rail radio network.

The nearest IR GSM-R basestation to the proposed wind farm is in the townland of Cloonafearagh, approximately 4.5 km from the development, is sufficiently distant to mitigate any potential interference. At this distance, it is highly unlikely that there would be any impacts on the Irish Rail communications network, due to turbines at the proposed development. Furthermore, precedent exists across Ireland where wind turbines are situated within 5 km of Irish Rail infrastructure without adverse effects on communications. These factors collectively support the conclusion that the proposed development poses no risk to the operational integrity of the Irish Rail communications network. Please refer to the accompany Appendix 17.2 (Volume III of this EIAR) for further details in relation to this assessment.

There are no potential construction related effects for electromagnetic interference and broadcasting interests in the area associated with the Site, Grid Connection Route, or the Turbine Delivery Route.

17.5.2.3 Aviation

As part of the scoping and consultation process for the Proposed Development, the Draft DoEHLG 2019 Guidelines show that construction infrastructure such as cranes required for the installation of turbines, wind turbines or any structure exceeding 90 metres in height can be an obstacle to low flying craft and to aerial navigation. Therefore, turbines and structures over 90m are required to be shown on aviation charts to aid aerial navigation from aviation centres such as airports and local airfields. Additionally, consultation was also conducted with the Irish Aviation Authority (IAA) and the Irish Air Corps (IAC) to ensure the Proposed Development had no impact with assets such as air navigation safety, airports, radar and aircraft guidance systems. In addition, the IAC state they are opposed to any wind farms or tall structures which may impact the following:

- Lands underlying military airspace used for flying activity, including designated Military Operation Areas (MOA);
- Areas wherein military flying occurs at low levels;
- Critical low level routes in support of IAC operational requirements.

The IAC also state that, in an effort to enhance safety in locations where wind farms or masts are permitted, they should be illuminated by high intensity strobe lights, be identifiable hazards relative to additional lighting in the vicinity and remain visible to night vision equipment.

As requested by the IAA, Clonbullogue Airfield have been contacted to make them aware of the Proposed Development. The review of Clonbullogue Airfield indicates that there will be no impact to the aviation activities at the airfield as documented in the AI Bridges' Aviation Assessment, Appendix 17.3.

No impacts are anticipated following consultation with the Irish Aviation Authority, Air Navigation Ireland, Dublin Airport Authority and Irish Air Corps. Any temporary accommodation works associated with the TDR will not affect aviation interests in the area.

There are no potential construction related effects for aviation in the area associated with the Site, Grid Connection Route, or the Turbine Delivery Route.

17.5.3 Operational Phase Effect

17.5.3.1 Material Assets - Utility Infrastructure

Once the Derrynadarragh Wind Farm is operational, the potential for negative effects on Material Assets and Utility Infrastructure is minimal. Maintenance of access tracks and infrastructure may require small amounts of imported fill, however, the impact of this is likely to be slight/imperceptible.

No impact on existing water or gas utility infrastructure is expected at the wind farm site during the operational phase.

The direct effect of electricity generated by the proposed development will give rise to a reduction in the quantity of fossil fuels required for electricity generation across the State. This will give rise to a long-term slight positive impact on renewable energy resource and will contribute to reducing Ireland's dependency on imported fuel resources. This will give rise to a long-term positive impact on renewable energy resource, with the proposed grid connection and onsite 110kV substation remaining in place upon decommissioning, and becoming an asset of the national grid under the management of EirGrid.

17.5.3.2 Telecommunications and Broadcasting

The potential for interference to telecommunications and broadcasting assets is greatest during the operational phase of a wind farm. To identify and eliminate any issues as early in the project as possible, consultations regarding the potential for electromagnetic interference from the Proposed Development have been assessed by AiBridges, please refer to Appendix 17.1- Telecommunications Impact Study, and Appendix 17.2 - Irish Rail Telecommunications Impact Study, Volume III of this EIAR. As a result of the introduction of wind turbines to a landscape, there is potential for negative impact to domestic broadcasting receivers due to signal scattering or signal delay. Consultation regarding the potential for electromagnetic interference from the Proposed Development was carried out with the relevant national and regional broadcasters, fixed line and mobile telephone operators and other operators. As described in Section 17.5.2.2, Imagine Broadband Network and Three Ireland responded to consultation detailing that they both have microwave links in the vicinity of the site that may be affected by the Proposed Development.

Imagine Broadband has two microwave radio links that run along the south of the site. The nearest turbine to the links is Turbine 1. There is clearance distance of over 70m between the Fresnel Zone (F1) of the radio links and the blade tip of the nearest turbine (T1). AI Bridges determine within their assessment that, *'there is a clearance distance of over 70 m between the Fresnel Zone (F1) of the radio links and the blade-tip of the nearest turbine (T01). At this distance there would be no impact to either of the Imagine Broadband radio links'*. Please refer to Page 22 of Appendix 17.1, Volume III of this EIAR.

Three Ireland has a PTP microwave radio link from Clonyquin to Rathangan that runs along the north of the site. The nearest turbine to the links is Turbine 2. There is there is a clearance distance of 25.5 m between the Fresnel Zone (F1) of the radio link and the blade-tip if the nearest turbine (T02). Page 22 of Appendix 17.1, Volume III of this EIAR, AI Bridges conclude that,

> "To further assess the potential impacts, the radio link has been modelled in 3D and the Clearance Distances between the Fresnel Zone (F1) and the blade-tip of the T02 has been calculated. A 3D view of the microwave radio link relative to the proposed turbine is shown below in Figure 9.

The 3D model indicates that there is a clearance distance of 25.5 m between the Fresnel Zone (F1) of the radio link and the blade-tip if the nearest turbine (T02). At this distance there would be no impact to the Three Ireland radio link."

Mitigation for potential impact of the Proposed Development on Three Ireland's microwave link is detailed in Section 17.7.2.

In February 2025, Irish Rail (IR) were contacted to determine if they had any concerns in relation to the proposed wind farm at Derrynadarragh, on the Offaly-Kildare border. In the response received from Irish Rail, it was stated that they operate a GSM-R Train Radio communications system in the vicinity of Derrynadarragh. Irish Rail also requested a 5km Exclusion Zone around their transmitting radio antennas. Ai Bridges Ltd were subsequently commissioned to evaluate the Irish Rail communications network and to assess the possible impacts that the proposed wind farm at Derrynadarragh could have on the Irish Rail radio network. As turbines at the proposed development would be at least 4.5 km from the nearest Irish Rail GSM-R basestation (located at Coolnafearagh), it is highly unlikely that there would be any impacts on the Irish Rail communications network. A software prediction of the service coverage from the Irish Rail basestation has been generated and shows that there would be no impacts from the proposed wind farm

It should also be noted that there are existing wind farms in Ireland with turbines that are located within 5 km of Irish Rail tracks (e.g. Ballymartin, Monaincha, Richfield, Cloontooa, etc.). These wind farms are operational for many years and there are no reports to\from the wind farm operators of any impact to the Irish Rail communications network.

Effects on overhead telecommunications services associated with the TDR will be confined to locations within the road corridor where temporary accommodation works will be required to facilitate the delivery of abnormal loads. There is potential that overhead lines may require brief disruption in the unlikely event that a turbine component requires replacement - in this case the turbine delivery route is required to be used during the operational phase. The effects on overhead telecommunications services would be similar to those described in Section 17.6.2.

The proposed wind farm development at Derrynadarragh is expected to have no impacts on telecommunications operators (Imagine Broadband and Three Ireland), and Irish Rail communications network during the operational phase. However with regards to the TDR, there is the potential for brief slight negative impact to telecommunications services along the TDR.

17.5.3.3 Aviation

As part of the scoping and consultation process for the Proposed Development, the Draft Wind Energy Development Guidelines (DoHLGH, 2019) indicate that construction infrastructure such as cranes required for the installation of wind turbines, or any structure exceeding 100 metres in height, can be an obstacle to low flying craft and to aerial navigation. Therefore, turbines and structures over 90m are required to be shown on aviation charts to aid aerial navigation from aviation centres such as airports and local airfields. Additionally, consultation was done with the Irish Aviation Authority (IAA) and the Irish Air Corps (IAC) to ensure the Proposed Development had no impact with assets such as air navigation safety, airports, radar and aircraft guidance systems.

Wind turbines within 30 km of a radio navigation aid have the potential to lead to electro-magnetic interference with these signals. However, as the proposed wind farm is c. 60 km from the Localizers and transmitting antennas, and located in areas not in line with signals or transmitters, it is deemed very unlikely that turbines at the Proposed Development will have any impact on these ATS communications and radio navigational aids. Typically, interference to VHF communications systems will only occur when obstacles are in close proximity to the VHF transmitter.

As outlined in the Derrynadarragh Wind Farm Aviation Review Statement, there are other existing tall structures (obstacles) nearer to Dublin Airport than the proposed wind farm, notably the 2RN telecommunications masts at Kippure, Three Rock and Clarkstown. The existing wind farms at Mount Lucas and Cloncreen, are also located at a similar distance from Dublin Airport as the proposed wind farm at Derrynadarragh. The Derrynadarragh Wind Farm Aviation Review Statement also states further technical assessments of the Proposed Development in relation to aviation, with a summary shown in Table 17-2: Derrynadarragh Wind Farm Aviation Review Statement Summary, below.

Table 17-2: Derrynadarragh Wind Farm Aviation Review Statement Summary

Item	Impact	Summary
Annex 14 - Obstacle Limitation Surfaces (OLS)	None	The proposed turbines are located outside the OLS Surfaces for Dublin Airport.
Annex 15 - Aerodrome Surfaces	None	The proposed wind turbines would not penetrate the ICAO Annex 15 Aerodrome Surface. All obstacles, if more than 100 meters above terrain for a distance of 45km from center point of Dublin Airport, need to be registered in the IAA Air Navigation Obstacle Data Set. The IAA may request that the turbines be included in the IAA Aeronautical Electronic Obstacle Data Sets. It should be noted that there are existing tall structures nearer to Dublin Airport than the proposed development (e.g. existing telecoms masts at Clarkstown, Kippure and Three Rock) which are already listed in the IAA Aeronautical Electronic Obstacle Data Sets.
Building Restricted Areas	None	A review shows that Derrynadarragh is more than 50 km from the BRA for Dublin Airport. At this distance there would be no impacts due to the proposed wind farm.
Minimum Sector Altitudes (MSA)	None	A review of the Minimum Sector Altitudes (MSA) shows that the proposed wind farm is outside 25 nautical miles from the VOR/DME at Dublin Airport. Therefore the MSA of the relevant sector will not be affected and there will be no impact on the published MSA altitude figures.

Item	Impact	Summary
Instrument Flight Procedures	None	A review shows that the proposed wind farm is sufficiently far from Dublin Airport that it is highly unlikely that there would be any impacts to instrument flight procedures for flights to/from Dublin Airport for precision aircraft.
Communication and Navigation Systems	None	As the proposed wind farm is approximately 60 km from the Localizer and transmitting antenna at Dublin Airport, it is very unlikely that the proposed development will have any impact on these ATS communications and radio navigational aids.
Radar Surveillance Sensors	None	The proposed wind turbines would be located in Assessment Zone 4 (EuroControl guidelines) for SSR and PSR instruments and a detailed Impact Assessment will not be required.
Flight Inspection and Calibration	None	A review of the Flight Inspection Procedures indicates that there will be no impacts due to the proposed wind farm development.
IAA - Aeronautical Obstacle Warning Light Scheme	None	It is possible that the IAA may request that the wind farm, if permitted, would be fitted with Aeronautical Obstacle Warning Lights in accordance to industry standards. Subject to further consultation with the IAA.
Private Airfields (VFR Flying)	None	The proposed wind farm is sufficiently far (>5 km), that there would be no impact to aviation activities at the private airfield at Clonbullogue. However, the IAA have requested that the airfield operator (The Irish Parachute Club be notified of the proposed wind farm development.
DoD Aeronautical Safeguarding	Subject to further review.	The proposed wind farm is not located in an IAC restricted area and it is highly unlikely that turbines at the proposed site would have any impact on IAC aviation activity. However, the DoD have made specific observations regarding an Aeronautical Obstacle Warning Light Scheme for the IAC. A review of the specified IAC Aeronautical Obstacle Warning Light Scheme may require a further detailed assessment to demonstrate that there will be no residual impacts.
Garda Air Support Unit and Emergency Aeromedical Service	None	An assessment of GASU and EAS operations indicate that they are unlikely to be impacted by the proposed wind farm development.

Though, no impact on Air Corps activities is expected, wind turbines may be considered as 'en-route obstacles', requiring an aeronautical obstacle warning light scheme. Though the Proposed Development site at Derrynadarragh is located outside restricted areas for the Irish Air Corps and the Department of Defence, the Scoping Response received from the Minister for Defence, as contained within Chapter 5: EIA Scoping and Consultation, outlined the following:

> *"All turbines should be illuminated by Type C, Medium intensity, Fixed Red obstacle lighting with a minimum output of 2,000 candela to be visible in all directions of azimuth and to be operational H24/7 days a week. Obstacle lighting should be incandescent or, if LED or other types are used, of a type visible to Night Vision equipment. Obstacle lighting used must emit light at the near Infra-Red (IR) range of the electromagnetic spectrum, specifically at or near 850 nanometres (nm) of wavelength. Light intensity to be of similar value to that emitted in the visible spectrum of light.*
> *Any Irish Air Corps (IAC) requirements for are separate to Irish Aviation Authority (IAA) requirements."*

The potential obstacles for low-level operations of the Garda Air Support Unit (GASU) and Emergency Aeromedical Service (EAS) are unlikely to affect their operations due to the sparse population and terrain in the area.

The development lies over 60 km from Dublin Airport's Building Restricted Areas (BRA) and no significant interference is expected.

There are no operational related impacts on aviation interests as a result of the proposed Site, Grid Connection Route, and Turbine Delivery Route.

17.5.4 Decommissioning Phase

17.5.4.1 Material Assets - Utility Infrastructure

Decommissioning works will include removal of above ground structures including the turbines. Turbine foundations, access tracks and electrical assets such as substation buildings will be left in situ and taken in charge of by Eirgrid / ESB which will have a long-term slight positive effect on electricity infrastructure provision in the area.

There is potential for brief disconnection of overhead lines during the decommissioning phase if large turbine components are required to be removed from the wind farm site. This has potential to cause a brief slight negative impact to telecommunication services where overhead lines require disconnection.

Increased traffic numbers on the local, regional and national roads will have a temporary slight negative impact on the road network due to increased traffic.

There will be no likely negative impacts on utilities during the decommissioning phase.

17.5.4.2 Telecommunications and Broadcasting

The potential for electromagnetic interference from wind turbines occurs only during the commissioning and operational phase of the Proposed Development. There are no electromagnetic interference effects associated with the decommissioning phases of the Proposed Development, and therefore no mitigation is required.

The proposed on-site substation and grid connection will be left in situ. There are no decommissioning related effects on telecommunications and broadcasting interests in the area.

17.5.4.3 Aviation

During the decommissioning phase, the turbines will be dismantled and removed from the site, thereby removing all potential obstacles to future aviation interests. There will be no likely effects on aviation during the decommissioning phase.

17.6 Mitigation Measures

17.6.1 Material Assets - Utility Infrastructure

The delivery of turbine components to the Site will require temporary accommodation works along the TDR (as set out in Chapter 2: Development Description) which will include the requirement to remove utility poles. Such works will be agreed and carried out by the service provider in advance of turbine delivery and will result in localised disruption to service. Accommodation works for the delivery of turbine components from Galway Port to Site will be brief to temporary non-significant negative effects on dwellings and commercial/industrial activities within the catchment of the services.

Where services are required to be interrupted to accommodate turbine delivery and grid connection works, residents and business in proximity to the works will be informed in advance. Additionally the service providers will notify the public of any such interruptions or changes in water pressure, as is current practice (e.g. https://www.water.ie/help/supply/no-water-or-low-pressure/?map=supply-and-service-updates and https://www.esbnetworks.ie/power-outages).

The comprehensive turbine delivery procedure which will be implemented between Galway Port and the Proposed Development site at Derrynadarragh will include safety procedures, and a Garda escort, in accordance with the Traffic Management Plan, as contained in Appendix 14.1 Volume III of this EIAR.

Any accommodation works within the public road corridor will be carried out in advance of the turbine deliveries in agreement with the local authority and subject to a road opening license. The development will be constructed to ensure that all temporary/permanent works within the road curtilage of public roads will be as per the Purple Book (Guidelines for Managing Openings in Public Roads, 2017). If any damage to existing footpaths or cycle lanes occurs during the delivery of components, these sections will be replaced by the awarded civils contractor as per The Purple Book (Guidelines for Managing Openings in Public Roads 2017 (SD12 Footways: Concrete Permanent Reinstatement).

It is likely that turbine delivery will take place outside of regular travelling/commuting hours in order to avoid potential traffic effects on major routes.

17.6.2 Telecommunications and Broadcasting

Mitigation measures consist of mitigation by design to avoid effects on telecommunication links. Turbine 2 has been microsited to remove any potential interference with Three Ireland's microwave link that was noted during consultation. Therefore, no additional mitigation measures are required or proposed for telecommunications and broadcasting for the construction, operation, or decommissioning phase of the Proposed Development.

Overhead telecommunication lines along the TDR may be briefly disconnected during turbine delivery during the construction phase. Any interference to service will be brief (lasting less than 1 day) and potential effects to service will be communicated in advance to those affected. Notice will be provided to all stakeholders affected prior to works commencing.

There is potential for brief disconnection of overhead lines during the decommissioning phase if large turbine components are required to be removed from the wind farm site. This has potential to cause a brief slight negative effect to telecommunication services where overhead lines require disconnection. Notice will be provided to all stakeholders affected prior to decommissioning works commencing.

17.6.3 Aviation

In line with standard practice for wind farm developments, the coordinates and elevations for turbines will be supplied to the IAA at the end of the construction phase. An aeronautical obstacle lighting scheme will be agreed with IAA in line with IAA's consultation response and applied to the proposed turbines. Should the proposed wind farm be permitted, the turbine locations would be added to aviation flight charts and clearly marked as en-route obstacles.

17.7 Cumulative Impacts

Accompanying this EIAR, a list of all developments, existing, consented or currently in planning within 20km of the site (Study Area) is enclosed at Appendix 1.3 - Developments Considered for Cumulative Assessment (Volume III of this EIAR) , with no cumulative impacts identified.

17.7.1 Material Assets - Utility Infrastructure

There is potential for slight, short-term interruption of material assets and utility services along the TDR during turbine delivery. TDR works along public roadways have potential to cause non-significant brief effects where street furniture/sign removal, installing of temporary load bearing surfaces and vegetation trimming is needed. Brief impact may also occur to the supply of electricity and telecommunications to homes and businesses as a result of temporary removal of services to accommodate turbine delivery. Notice will be provided to all stakeholders affected prior to works commencing.

17.7.2 Telecommunications and Broadcasting

There are no effects for electromagnetic interference and broadcasting interests related to the construction or operational phases in the area. As the substation and related electrical infrastructure will be left in-situ once the wind farm has been decommissioned, there are no effects on telecommunications and broadcasting in the area related to the decommissioning.

17.7.3 Aviation

As outlined in Appendix 17.3 - Aviation Review Statement there are existing tall structures nearer to Dublin Airport than the proposed development (e.g. existing telecoms masts at Clarkstown, Kippure and Three Rock) which are already listed in the IAA Aeronautical Electronic Obstacle Data Sets. The Aviation Review Statement highlights that the operational Wind Farms of Mount Lucas Wind Farm and Cloncreen Wind Farm did not require a Full Assessment of Instrument Flight Procedures.

17.8 Residual Effects

17.8.1 Material Assets - Utility Infrastructure

The electrical infrastructure associated with the Proposed Development at Derrynadarragh will be taken in charge of by Eirgrid or ESB following decommissioning, providing a long-term slight positive residual impact on electricity infrastructure in the area.

17.8.2 Telecommunications and Broadcasting

Following the implementation of mitigation measures, no significant residual effects are expected on telecommunications and broadcasting as a result of the Proposed Development of Derrynadarragh Wind Farm.

17.8.3 Aviation

Within Appendix 17.3 - Aviation Review Statement, it is noted that the site is not located in a restricted area and it is highly unlikely that the turbines at the Site would have any impact on aviation activity, thereby showing no residual effects on aviation as a result of the Proposed Development.

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17.9 Conclusion

In consideration of the above with regard material assets and utilities, it is considered unlikely that the Proposed Development will interfere with, or disrupt, any infrastructure associated with material assets and utilities. Consultations with utility stakeholders confirming that there is no significant interference with electricity, water, or gas networks in the construction, operational or decommissioning phases of the Proposed Development.

As outlined throughout this EIAR, the Proposed Development includes pro-active design measures and mitigations to ensure that construction activities do not affect existing infrastructure, and all necessary adjustments to roads or TDR's will be managed through careful planning in conjunction with the relevant authorities, as outlined above. Any potential impacts on material assets and utility services during the operational phase are considered to be negligible, with a positive contribution to national electricity networks and infrastructure through the leaving in-situ of the substation and electrical infrastructure once the Proposed Development is decommissioned.

The Proposed Development was thoroughly assessed by AiBridges for any potential Electromagnetic Interference (EMI) with telecommunications and broadcasting systems in or near the Proposed Development site. During the consultation process with all key stakeholders and extensive site analysis conducted by AiBridges, as contained within the Electromagnetic Interference (EMI) Impact Assessment, no significant issues were raised by telecom or broadcasting stakeholders. One Three Ireland's microwave link was identified that could be impacted by the Proposed Development. Mitigation Measures were implemented where turbine was microsited to eliminate any interference of links traversing the site, with no further action proposed in the EMI Impact Assessment by AiBridges.

The Proposed Development has also been assessed by AiBridges in relation to aviation, with the Derrynadarragh Wind Farm Aviation Review Statement focusing on potential impacts on radar systems, flight procedures, and obstacle limitation surfaces. The proposed wind farm is not located in an IAC restricted area and it is highly unlikely that turbines at the proposed site would have any impact on IAC aviation activity. However, the DoD have made specific observations regarding an Aeronautical Obstacle Warning Light Scheme for the IAC. A review of the specified IAC Aeronautical Obstacle Warning Light Scheme may require a further detailed assessment to demonstrate that there will be no residual impacts. Should the Proposed Development be consented, the turbine locations will be included in the Irish Aviation Authority's (IAA) 'Air Navigation Obstacle Dataset', to ensure that no adverse effects on aviation arise due to the Proposed Development.

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