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DESIGNING AND DELIVERING A SUSTAINABLE FUTURE

ENVIRONMENTAL IMPACT ASSESSMENT REPORT (EIAR) FOR THE PROPOSED CLOONKETT WIND FARM, CO. CLARE

VOLUME 2 - MAIN EIAR

CHAPTER 16 - MATERIAL ASSETS, TELECOMMUNICATIONS AND AVIATION

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16 MATERIAL ASSETS, TELECOMMUNICATION AND AVIATION

16.1 Introduction

This Chapter describes Material Assets and Utility Infrastructure, Telecommunications and Broadcasting and Aviation that might potentially be affected by the Proposed Development. The potential effects 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; and
- Aviation.

A comprehensive description of the Proposed Development at Cloonkett is shown in EIAR Chapter 2: Development Description. The Proposed Development consists of a 14 no. turbine wind farm and associated infrastructure, onsite 220 kV loop in/out substation and associated grid connection infrastructure.

EIAR Chapter 2 – Description of the Proposed Development also includes the general layouts of the Proposed Wind Farm, Grid Connection (GC), Turbine Delivery Route (TDR) and BMEP Lands, which are presented in Figure 2-1: Wind Farm Site Location, Figure 2-2: Wind Farm Site Layout and Figure 2-3: Turbine Delivery Route, contained within Volume IV of this EIAR, and comprises the following elements:

- The 'Proposed Wind Farm' (also referred to in this EIAR as the 'Site');
- 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 Management and Enhancement Plan Lands' (also referred to in this EIAR as the 'BMEP Lands').

The proposed candidate turbine for the purposes of this EIAR/ Planning Application is a Vestas-136 (4.5 MW), this is a conventional three-blade horizontal axis turbine. The final make and model will be determined by tender process, subject to Planning consent being granted, however, the following design parameters/turbine specification will apply:

- Ground to blade tip height of 150m;
- Hub height of 82m;
- Rotor diameter of 136 m.

Dimensions of the candidate turbine are shown in planning application detail drawings.

16.2 Statement of Authority

This chapter has been prepared by Anthony Ryan and reviewed by Conor Auld and Jim Hughes, all of Fehily Timoney and Company.

Anthony Ryan is a Project Planner with a Masters in Planning and Sustainable Development (MPlan) from University College Cork. Anthony has experience working on various renewable energy projects preparing EIAR chapters for wind farms including traffic and transport, air and climate, telecommunications and aviation.

Conor Auld is a Senior Planner with a MSc in Urban and Rural Design and BSc in Environmental Planning from Queen's University Belfast. Conor also holds an advanced Diploma in Planning and Environmental Law from The Honourable Society of King's Inns. Conor has prepared several EIAR Chapters and assisted in EIAR management for wind farm developments throughout Ireland.

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 experience having being Project Director/ Project Manager for the submission of numerous SID Wind Farm Projects and the submission of multiple SID applications for onshore electrical infrastructure under Section 182 of the Planning and Development Act.

16.3 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* refers to built services, roads and traffic and waste management. 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 many EIAR Chapters, including but not limited to, Chapter 6: Population and Human Health, Chapter 9: Biodiversity and Chapter 10: Soils, Geology and Hydrogeology. Assets of Archaeological, Architectural and Cultural Heritage are considered in Chapter 14: Archaeology, Architectural and Cultural Heritage of this EIAR. A Waste Management Plan (WMP) for the Proposed Development has been included in the CEMP, Appendix 2.1 of Volume III of this EIAR.

16.3.1 Electromagnetic Interference

Electromagnetic interference on existing telecommunication and broadcasting services from wind farms 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 Electromagnetic Interference (EMI) Impact Assessment compiled by AiBridges (Appendix 16.2 of Volume III of this EIAR), point-to-point (PTP) and point-to-multipoint signals are considered, with both extensively throughout Ireland.

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-point is a wireless telecommunications transmission link between two nodes located at specified fixed points. 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.

16.3.2 Broadcast Communications

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.

16.3.3 Domestic 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.

16.3.4 Other Signal Types

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. The nearest such operational airport to the Proposed Development is Shannon Airport, located c. 14.88km east of the Proposed Development.

Potential effects on broadcast communications are generally identified and eliminated during the design phase of a project. This is generally done 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). This process was implemented in the case of this Proposed Development, where turbines were moved and micro-sited to eliminate any interference of links traversing the site once a link traversing the site was identified, shown within the Electromagnetic Interference (EMI) Impact Assessment compiled by AiBridges, Appendix 16.2 of Volume III of this EIAR, and shown in Figure 16.1 of Volume IV of this EIAR, and described in Section 16.5 *Telecommunications & Broadcasting* of this EIAR chapter.

16.3.5 Consultation and Methodology

Section 5.10 of the current *Wind Energy Development Guidelines* (DoEHLG, 2006) states:

> *"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."*

Also, Section 7.15 of the WEDGs (DoEHLG, 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 and broadcasting stakeholders (as well as utility and aviation stakeholders) that could potentially be affected by the Proposed Development were identified through field and desktop surveys, in addition to consultation with national operators. Initially, a desktop examination of resources and infrastructure was conducted in the area of the Site 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 the key utility, resource and telecommunication stakeholders and aviation authorities were consulted. Scoping was carried out in accordance with the EPA Guidelines[1] and the *Best Practice Guidelines for the Irish Wind Energy Industry 2012*[2] 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 the consultation process.

The following assessment methodology was applied:

- Wide ranging consultation with utility, telecommunications, broadcasting and aviation stakeholders that could potentially be affected by the Proposed Development (see Chapter 5 EIA Scoping and Consultation and the Electromagnetic Interference (EMI) Impact Assessment and Cloonkett Wind Farm EMI Impact Assessment Report, contained within Appendix 16.1 and Appendix 16.2 of Volume III of this EIAR).

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

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

- As described within Cloonkett Wind Farm EMI Impact Assessment Report (Appendix 16.1 of Volume III of this EIAR), identification of aerodromes, airports and any associated infrastructure in proximity to the Proposed Development, as well as conducting consultations with relevant aviation authorities such as the Irish Aviation Authority, Air Navigation Ireland, Shannon Airport Authority and the Irish Air Corps;
- As described within Cloonkett Wind Farm EMI Impact Assessment Report (Appendix 16.2 of Volume III of this EIAR), comprehensive data gathering exercises were conducted to establish all known telecommunications and broadcasting links 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 material assets and utility infrastructure such as Gas, Water, Electricity Cables and if necessary, identify mitigation measures; and
- Review of turbine delivery route in the context of overhead power and telecommunication lines.

This assessment has considered the turbine arrangements and dimensions, as described in EIAR Chapter 2 - Development of the Proposed Description.

16.3.6 Relevant Policy and Guidance Documents

As described in detail within EIAR Chapter 4 - Policy, a review of relevant policy and guidance documents was undertaken for all aspects of the Proposed Development, and to identify specific relevant Policies and Objectives relating to utility services, telecommunication, broadcasting and aviation and included:

- *Wind Energy Development Guidelines* (WEDGs), Department of the Environment, Heritage and Local Government (DoELHG, 2006).
- *Best Practice Guidelines for the Irish Wind Energy Industry*, 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).
- Clare County Development 2023 – 2029.

16.4 Material Assets and Utilities

This section provides a comprehensive overview of the Material Assets and Utilities of the receiving environment in order to provide an understanding of the potential effects of the Proposed Development at Cloonkett.

16.4.1 Methodology

As part of the scoping and consultation process for the Proposed Development, and 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.

Private and 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.

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, with a summary of the consultation responses received also presented in *Table: 16-1 Material Assets and Utilities Scoping and Consultation Responses Received*, below.

16.4.2 Limitations

No limitations were encountered in the assessment of the potential effect on material assets and utilities from the Proposed Development.

16.4.3 Baseline Environment

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.

16.4.4 Assessment of Likely Significant Effects

16.4.4.1 Do- Nothing Scenario

If the Proposed Development at Cloonkett were not to proceed, it is unlikely there would be changes to the existing Material Assets and Utilities.

16.4.4.2 Construction Phase Effects

Scoping and consultation responses received relevant to Material Assets and Utilities are shown below in *Table 16-1: 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 16-1: Material Assets and Utilities Scoping and Consultation Responses Received

Utility Provider	Date received	Response recieved
Eirgrid	11/09/2023	Acknowledged they had received the consultation request, but no further response was received. However, in May 2024 (16/05/2024) the Applicant had a Client Consultation Clinic with EirGrid to discuss the potential GCR options and the rationale for the proposed new on-site 220kV loop-in/out substation with connection to the existing OHL.
ESB Networks (ESBN)	18/09/2023	Stated they do not provide feedback on individual EIA scoping reports, while drawing attention to the ESB capacity heat map which contains capacity information on all the 3-phase LV, MV, and HV DSO substations.
Gas Networks Ireland (GNI)	15/09/2023	Advised that the Proposed Development does not impact on the GNI network. They also provided a recommendation for the contractor to use the 'Dial Before you Dig' system to ensure that the required response is received in a timely manner while outlining that the online system can give immediate mapping of an area, once an account is registered and activated.
Uisce Éireann (formerly Irish Water)	18/09/2023	Stating they do not have the capacity to advise on the scoping of individual projects. However, they provided a set of general principles/considerations for EIAR assessment on Water Services, which is further outlined within the Chapter 5: Scoping and Consultation of this EIAR.

As outlined above, Eirgrid and ESB Networks (ESBN) provided no feedback, with no Gas Networks Ireland (GNI) gas transmission lines or Uisce Éireann (formally Irish Water) mains water line utility identified within the Proposed Development site boundary.

Uisce Éireann require developers to engage in pre-planning consultation with them where there is a potential for proposed infrastructure to be constructed close to their assets. An onsite 220kV loop-in/out electricity substation will be constructed within the Proposed Development site to provide a connection between the wind farm and the national grid via a loop-in connection to the existing Prospect – Cashla 220 kV OHL. Therefore, as no underground cabling is required on or near Uisce Éireann assets, there will be no interactions between the grid connection cable and Uisce Eireann assets, so no pre-planning consultation or *'Building-over or Near an Irish Water Asset*' application to the Uisce Éireann's Diversions Team is required.

As described within Section 13.4.5.1 Turbine Delivery Route of EIAR Chapter 13 - Traffic and Transportation, most loads associated with this Proposed Development are of standard size and can navigate the national road network without transport issues. Turbine component deliveries will be carried out during off-peak times and will be done using a convoy and a specialist heavy haulage company. Turbine deliveries will also be escorted by An Garda Siochána. This will ensure the impacts of the turbine deliveries on the existing road network are minimised.

As described in *Section 13.4.5*, accommodation works are required along the TDR. 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. All temporary accommodation works associated with the TDR will be fully reinstated following the construction stage.

Turbine delivery works could potentially cause traffic disturbance and damage to road infrastructure if not properly planned and managed. Pre-planning consultation with *Clare County Council's Roads Department* regarding the proposed TDR works has been carried out, and potential impact on road infrastructure; an overview is provided in EIAR Chapter 13 - Traffic and Transportation. Additionally, subject to planning being consented, the Traffic Management Plan (TMP) will be finalised in consultation with the relevant statutory agencies and key stakeholders prior to the commencement of construction and it will be implemented for the duration of the works.

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. The works to facilitate the delivery of turbine components to the Proposed Development site are detailed in EIAR Chapter 2 – Description of Proposed Development, and the Traffic Management Plan included in Section 4.3.7 of the CEMP.

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

16.4.4.3 Operational Phase Effect

Once the Proposed Development is operational, the potential for negative effects on Material Assets and Utilities is minimal. Maintenance of access tracks and infrastructure may require small amounts of imported fill, with a breakdown of volumes of fill required provided in Section 10.5 of EIAR Chapter 10 - Soils, Geology and Hydrogeology, however, the impact of this is likely to be slight/imperceptible.

No impact on existing water or gas utility infrastructure is expected due to the Proposed Development during the operational phase. EIAR Chapter 10: Soils, Geology and Hydrogeology, Section 10.4.7.5.1, provides further information regarding potential impacts on local drinking water supplies/water schemes is described within Public Water Supplies and Source Protection Zones.

The direct positive effects from the electricity generated by the Proposed Development will give rise to a reduction in the quantity of fossil fuels required for electricity generation in the County and across the State. This will give rise to a long-term positive impact on renewable energy resource, with the proposed grid connection and onsite 220kV substation remaining in place upon decommissioning, and becoming an asset of the national grid under the management of EirGrid. By enhancing the electrical infrastructure and grid connectivity of the area containing the Proposed Development, this facilitates the integration of further renewable energy projects in the area, thus further contributing to the national and local electrical infrastructure while also streamlining grid connections and maximizing renewable energy deployment.

16.4.4.4 Decommissioning Phase

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

Increased traffic on the local, regional and national roads will potentially have a temporary slight negative impact on the road network during commissioning.

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

16.4.5 Mitigation Measures

Existing material assets and utilities which may be impacted along the proposed TDR will be assessed in the pre-construction surveys, subject to planning consent. This will minimise the effects in terms of disruption or damage to existing utilities. Communication with service providers will be maintained for the duration of the construction works, as outlined within, Section 3.3.12 Internal Wind Farm Cabling Works of the Construction and Environmental Management Plan (CEMP), Appendix 2.1 of Volume III of this EIAR.

Where services will be interrupted to accommodate delivery of infrastructure components, 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 the Port of Entry and the Proposed Development site at Cloonkett will include safety procedures, and a Garda escort, in accordance with the TMP, contained in Section 4.3.7 of the CEMP (Appendix 2.1 of Volume III of this EIAR).

Any accommodation works within the public road corridor will be carried out in advance of the deliveries in agreement with the local authority and subject to a road opening licence(s). Construction of the Proposed Development will ensure that all temporary/permanent works within the road curtilage of the national roads (N68, N69, N85,) will comply with standard Guidance described in the *Purple Book: Guidelines for Managing Openings in Public Roads, Guidelines for the Opening, Backfilling and Reinstatement of Openings in Public Roads Second Edition (Revision 1)* (DTTS, 2017).

If any damage to existing footpaths or cycle lanes occurs during the delivery of infrastructure components, these sections will be replaced by the civils contractor as per *The Purple Book: Guidelines for Managing Openings in Public Roads* (SD12 Footways: Concrete Permanent Reinstatement).

The location of the temporary accommodation works for the delivery of components are summarised in *Table 16-2: Accommodation Works on the Turbine Delivery Route*, below.

Table 16-2: Accommodation Works on the Turbine Delivery Route

TDR Node Reference	Location	Planning Drawing Series No.Details	Summary of Proposed Temporary Accomodation Works
1	M18 Junction 9	COLLETT DRAWING NO. 380211-60A1.1	Removal of street furniture and road signs
2	Skehanagh Roundabout	COLLETT DRAWING NO. 380211-80A1.1	Chevron sign to be removed
3	Clareabby Roundabout	COLLETT DRAWING NO. 380211-85A1.1	Remove road signs and fence.
4	N85/N68 Roundabout	COLLETT DRAWING NO. 380211-90A1.1	Chevron sign to be removed. Splitter island to be cleared. Removal of street furniture and railing.
5	N68/R475 Roundabout	COLLETT DRAWING NO. 380211-95A1.1	Temporary hard standing across roundabout centre island. Splitter island to be cleared
6	N68/L6180 Junction	COLLETT DRAWING NO. 380211-500A1.1	Laying of load bearing surfacing, removal of street furniture, divert overhead utility service lines.
7	L6180 Left Hand Bend	COLLETT DRAWING NO. 380211-510A1.1	Laying of load bearing surfacing, tree trimming, divert overhead utility service lines.
8	L6180 / Proposed Cut Through Junction	COLLETT DRAWING NO. 380211-530A1.1 380211-540A1.1 380211-550A1.1 380211-560A1.1	Laying of load bearing surfacing, access track upgrade works, tree and hedgerow removal, divert overhead utility service lines.

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

16.4.6 Cumulative Impacts

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.

16.4.7 Residual Effects

The material assets and utilities associated with the electrical infrastructure for the substation and OHL connection will be taken in charge of by Eirgrid or ESB following decommissioning, to provide future long term enhanced electrical infrastructure for the region, thus providing a long-term positive residual impact on electricity infrastructure in the area.

16.5 Telecommunications & Broadcasting

16.5.1 Methodology

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 an Electromagnetic Interference (EMI) Impact Assessment conducted by AiBridges, attached as Appendix 16-1 of Volume III of this EIAR. The methodology utilised by AiBridges included Telecom Operator Consultations, Field Surveys and Desktop Survey Network Modelling and Analysis.

AiBridges commenced consultations with telecom and broadcasting stakeholders in May 2022, with *Table 16-3: Telecommunications and Broadcasting Consultations Responses Received*, below, showing the date the telecom and broadcasting operator was contacted, the issues raised and response received, which were then considered to positively identify network infrastructure that could be impacted by the Proposed Development which require mitigation or design alterations to eliminate possible interference with signals or links.

To assess the accuracy of the network information (radio link co-ordinates, antenna heights etc.) provided by the telecom operators, field surveys of the telecom-mast sites in the vicinity of the Proposed Development were carried out. During the field surveys, radio antennas with bearings in the direction of the wind farm were recorded. The telecom mast-sites surveyed for this study (labelled Mast-Site A and Mast-Site B) are shown relative to the proposed wind farm site in Plate 16-1: Microwave Radio Link Crossing Over/Near the Proposed Development, below, with the findings from the field surveys of the mast-sites are presented in Appendix B of the EMI Impact Assessment Report, conducted by AiBridges.

16.5.2 16.4.2 Limitations

No limitations were encountered in the assessment of the potential effect on telecommunications and broadcasting from the Proposed Development.

16.5.3 16.4.3 Baseline Environment

To establish the baseline environment in relation to telecommunication and broadcasting, AiBridges conducted an Electromagnetic Interference (EMI) Impact Assessment where they consulted with telecommunication and broadcasting stakeholders, and evaluated the possible impacts that the Proposed Development could have on existing telecommunications and broadcaster operator networks.

These consultations are described within the Cloonkett Wind Farm EMI Impact Assessment Report, contained within Appendix 16.1 of Volume III of this EIAR, and further described within EIAR Chapter 5: EIA Scoping and Consultation. The scope of work within the Cloonkett Wind Farm EMI Impact Assessment Report included field and desktop surveys to determine telecommunications network infrastructure that could be impacted by the Proposed Development.

Following consultations, shown in *Table 16-3: Telecommunications and Broadcasting Consultations Responses Received*, below, issues raised and response received from telecommunication and broadcaster stakeholders were used to positively identify network infrastructure that could be impacted by the Proposed Development. This information was then incorporated into field survey assessments, and during the consultation process, a desktop impact analysis was carried out, with all the telecommunication and broadcasting networks analysed using radio planning \ modelling software which indicate that there is at least one licensed microwave radio link traversing the Proposed Development site that could potentially be impacted, shown in Figure 16.1 Volume IV of this EIAR, and included for reference in Plate 16-1: Microwave Radio Link Crossing Over/Near the Proposed Development, below.

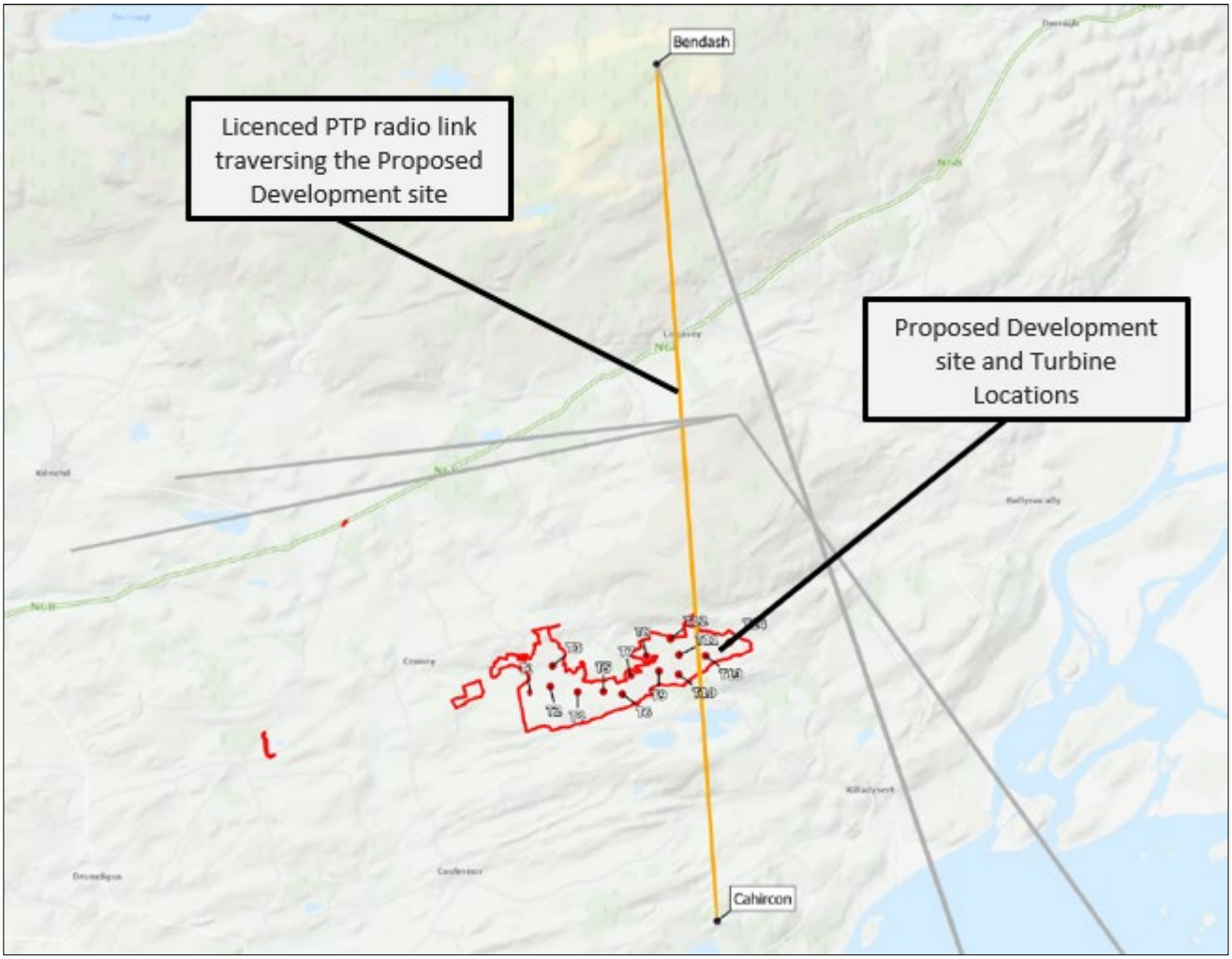

Figure 16-1: Microwave Radio Link Crossing Over/Near the Proposed Development

16.5.4 Assessment of Likely Significant Effects

16.5.4.1 Do- Nothing Scenario

If the Proposed Development at Cloonkett were not to proceed, it is unlikely there would be changes to the existing telecommunications and broadcasting operations in the area.

16.5.4.2 Construction Phase Effects

The potential for interference to telecommunications and broadcasting during the construction phase of the Proposed Development have been assessed by AiBridges, as described within the Cloonkett Wind Farm Electromagnetic Impact (EMI) Assessment Report, contained within Appendix 16.1 of Volume III of this EIAR. This assessment showed there is no potential electromagnetic interference effects associated with the construction phase of the Proposed Development on telecommunications and broadcasting in the area.

As the proposed grid connection element is located within the Proposed Development site, which contains no telecommunications and broadcasting infrastructure, there are no potential construction related effects for electromagnetic interference and broadcasting interests in the area associated with the Proposed Development.

16.5.4.3 Operational Phase Effect

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, as described within the Cloonkett Wind Farm Electromagnetic Impact (EMI) Assessment Report, contained within Appendix 16.1 of Volume III of this EIAR. AiBridges contacted sixteen key national and regional telecom and broadcasting stakeholders, fixed line and mobile telephone operators, with the responses received from each of the telecom and broadcasting stakeholders shown in Table 16-3: Telecommunications and Broadcasting Consultations Responses Received, below, and shown in Section 3 of the Cloonkett Wind Farm EMI Impact Assessment Report, contained within Appendix 16.1 of Volume III of this EIAR.

Table 16-3: Telecommunications and Broadcasting Consultations Responses Received

Consultee	Issues Raised	Response received
Enet	No issues	*"See analysis attached and potential impacts below – No potential impact."*
An Garda Síochána	No response.	*No response.*
Broadcast Authority of Ireland (BAI)	No issues	*"The BAI does not perform an in-depth analysis of the effect of wind turbines on FM networks.* *However, we are not aware of any issues from existing windfarms into existing FM networks.* *Also, the proposed windfarms are not located close to any existing or planned FM transmission sites."*

Consultee	Issues Raised	Response received
BT Ireland	No issues	*"We only have a network presence in Louth and Waterford."*
Eir	No issues	*No potential impact*
ESB Networks	No response.	*No response.*
Irish Aviation Authority (IAA)	No response.	*No response.*
Imagine Broadband	No issues	*No potential impact*
Clare County Council	No response.	*No response.*
Viatel	No response.	*No response.*
2RN	No issues regarding transmission links; however, 2RN have raised concerns about their broadcast service in the area and have requested that a protocol document be signed should the wind farm go ahead	*"With all of the sites there is a risk of interference to broadcast services from our site at Maghera in the areas proposed and we would ask that a protocol be signed between the developer and 2rn."*
Tetra Ireland (TI)	No issues	*"We anticipate no impact from the development as proposed, can you ensure the development is also reviewed by Eir."*
Three Ireland	No issues	*No potential impact*
Virgin Media	No issues	*No potential impact*
Vodafone Ireland	Vodafone have raised a concern regarding one Licensed PTP microwave radio link	*No impacts* *(Clearance Distance = 47 m*
Dept. of Defence	No response. (DoD is a statutory consultee and have previously stated that they will only respond to the Planning Authority under an RFI at Planning Application Stage.)	*No potential impact*

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. Further details and assessment of any proposed works are provided in Chapter 13 - Traffic and Transportation of the EIAR, and the TMP included in Section 4.3.7 of this CEMP.

This would result in a brief slight negative impact to telecommunications services along the TDR.

16.5.4.4 Decommissioning Phase

The potential for electromagnetic interference from wind turbines occurs only during the construction and operational phase of a 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.

16.5.5 Mitigation Measures

Mitigation measures related to the Proposed Development consist of mitigation by design to avoid effects on telecommunication and broadcasting links traversing or adjacent to the Proposed development site. Following site analysis and consultations with key national and regional telecom and broadcasting stakeholders, a single radio link traversing the Proposed Development site was identified that could potentially be impacted. This was operated by Vodafone Ireland, and is a licenced Point-to-Point (PTP) microwave radio link from Bendash to the north of the Proposed Development site, to Cahiracon on the south.

Mitigation measures were implemented where turbines were moved and micro-sited to eliminate any interference of links traversing the site, to provide an uninterrupted link traversing the site, as shown in Plate 16-1: Microwave Radio Link Crossing Over/Near the Proposed Development, above. Therefore, no additional mitigation measures are required or proposed for telecommunications and broadcasting for the construction, operation, or decommissioning phase of the Proposed Development.

There is potential for broadcasting to be affected at receivers close to the Proposed Development during the operational phase, i.e. nearby dwellings. Mitigation by design has been achieved with the closest residential property (Eircode: V15 FF83) being c. 517m Southeast of T1, and c. 558m South /Southwest of T2, which will reduce potential effects on receivers.

Overhead telecommunication lines along the TDR may be briefly disconnected during turbine delivery during the construction phase to facilitate machinery and plant moving large turbine components on site. 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 Proposed Development site. This has potential to cause a brief slight negative effect to telecommunication services where overhead lines require temporary disconnection to facilitate movement of machinery and plant carrying large turbine components. Notice will be provided to all stakeholders affected prior to decommissioning works commencing.

16.5.6 Cumulative Impacts

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.

16.5.7 Residual Effects

Following the implementation of mitigation measures following consultation with relevant stakeholders, no significant residual effects are expected on telecommunications and broadcasting as a result of the Proposed Development in Cloonkett.

16.6 Aviation

This section provides a comprehensive overview of the potential effects on aviation systems in the vicinity of the Proposed Development.

16.6.1 Methodology

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).

16.6.2 Limitations

No limitations were encountered in the assessment of the potential effect on aviation from the Proposed Development.

16.6.3 Baseline Environment

As described within the Cloonkett Wind Farm Aviation Review Statement, included in Appendix 16.2 of Volume III of this EIAR, wind turbines such as those associated with the Proposed Development have the potential to affect aviation communication and navigational systems and signal types, such as 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.

16.6.4 Assessment of Likely Significant Effects

16.6.4.1 Do- Nothing Scenario

If the Proposed Development at Cloonkett were not to proceed, it is unlikely there would be changes to the existing aviation operations in the area.

16.6.4.2 Construction Phase Effects

As described in Cloonkett Wind Farm Aviation Review Statement, the nearest operational airport to the Proposed Development is Shannon Airport, located c. 14.88km east of Turbine 14. Shannon Airport is a Class C controlled airspace, with both IFR (Instrument Flight Rules) and VFR (Visual Flight Rules) operations, with the Proposed Development within the Outer Horizontal Surface of Shannon's *Obstacle Limitation Surfaces* (OLS), and within 45km of the Aerodrome Reference Point (ARP), requiring registration in the IAA Obstacle Dataset.

The Proposed Development is c. 7.5km from the nearest *Building Restricted Areas*, with the maximum turbine heights remaining well below the 3,000 ft Minimum Sector Altitudes, ensuring no impact on published Minimum Sector Altitudes.

A desktop review of nine published *Instrument Flight Procedures* confirms no direct impacts, subject to IAA/AirNav technical review. Radar analysis indicates potential Primary Surveillance Radar (PSR) detection requiring further assessment. All turbines are located more than 29.7km from Woodcock Hill Secondary Surveillance Radar (SSR), and therefore, do not require detailed SSR analysis under Eurocontrol guidance.

16.6.4.3 Operational Phase Effect

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.

As described further within the Cloonkett Wind Farm Aviation Review Statement, and in reference to the Irish Air Corps (IAC), the report states the following:

"Irish Air Corps / Department of Defence (DoD) Safeguarding The Irish Air Corps position on wind farms / tall structures are outlined in the paper which was published in 2014: "Air Corps Wind Farm/ Tall Structures Position Paper". In the position paper the Irish Air Corps outlines restricted areas where they would object to the installation of wind turbines / tall structures. The areas defined by the Air Corps have been mapped and analysis shows that proposed wind farm site is located outside the restricted areas. As the proposed wind farm is not located in a restricted area it should have no impacts on the Irish Air Corps activities."

As described within the report, the nearest ''Air Corps restricted areas'' to the Proposed Development site is the 3 NM restricted area around the M7 Motorway, as shown within the area highlighted in Plate 16-2: Air Corps Restricted Areas, above. As the Proposed Development is located over 30km outside the restricted area, there will be no impacts on Irish Air Corps activities during the operational phase.

Annual calibration flights occur well above turbine height and are not affected. As shown in Plate 16-2: Air Corps Restricted Areas, below, the Proposed Development sits c. 30.2km outside Air Corps restricted zones, and no impacts are expected on Garda Air Support Unit or Emergency Aeromedical Service operations.

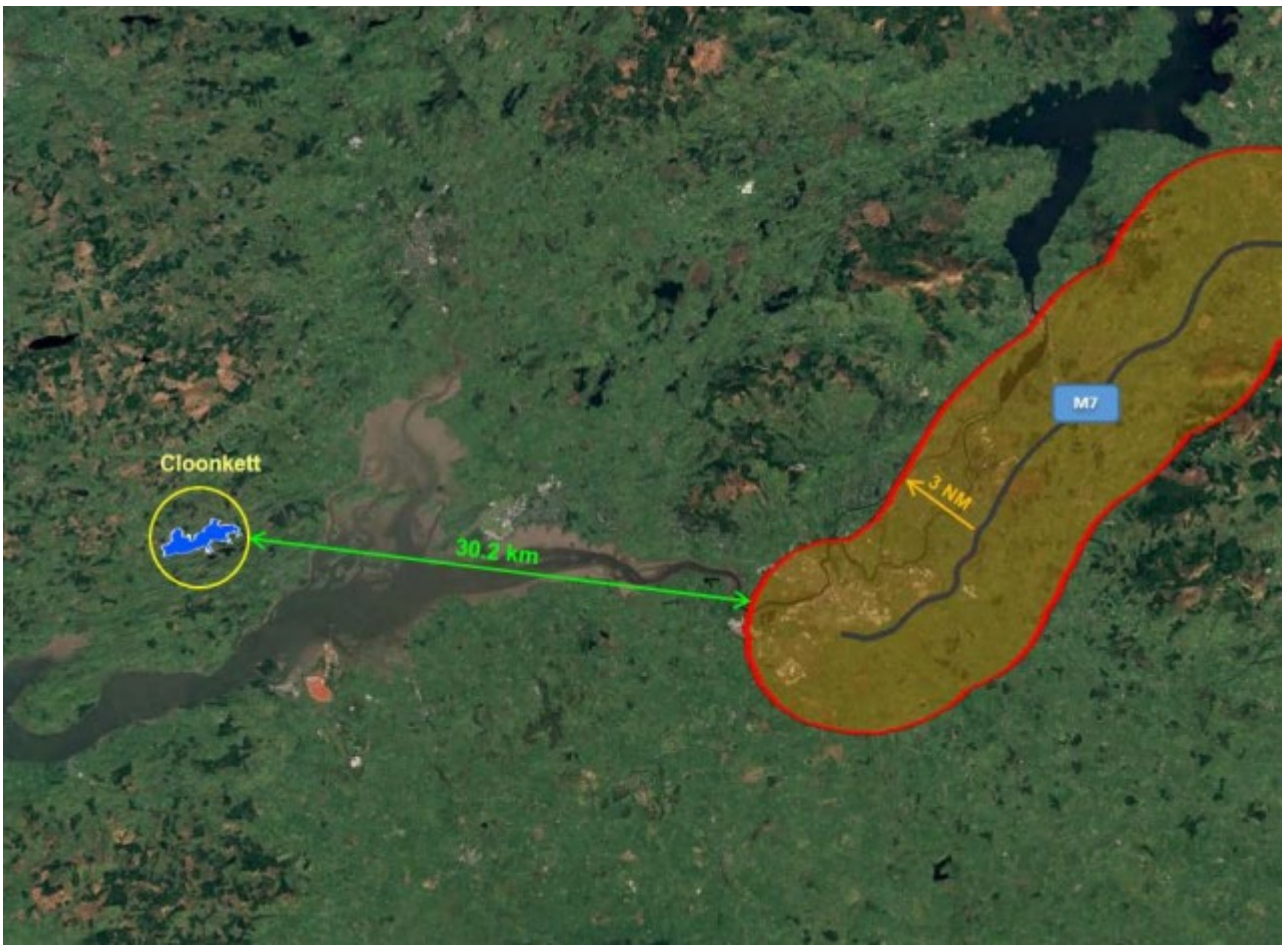

Figure 16-2: Air Corps Restricted Areas

A review of the Minimum Sector Altitudes (MSA) shows that the proposed wind farm is within 25 nautical miles from the VOR/DME at Shannon Airport, with the MSA providing a minimum obstacle clearance of 1000 ft above the highest obstacle within specified sectors. According to the wind farm location, the maximum construction height for the site would be 2000 ft/609.6m AMSL (3000 ft MVA minus 1000 ft). A 492ft (150m) turbine located at the highest point (374ft) within the proposed site boundary would result in an obstacle of 866ft AMSL. This is below the 2000ft threshold, therefore the MSA of the Main Sector will not be affected and there will be no impact on the published MSA altitude figures.

The Planning References for the permitted Wind Farms in the vicinity of the Proposed Development show none of the operational or permitted wind farms require a *Full Assessment of Instrument Flight Procedures*.

16.6.4.4 Decommissioning Phase

During the decommissioning phase, the turbines will be dismantled and removed from the site, with no likely effects on aviation during the decommissioning phase.

16.6.5 Mitigation Measures

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 Development get Planning consent, the turbine locations would be added to aviation flight charts and clearly marked as en-route obstacles.

16.6.6 Cumulative Impacts

As outlined in the Cloonkett Wind Farm Aviation Review Statement, there are other existing tall structures (obstacles) in the vicinity of the Proposed Development, notably the operational wind farms at Boolynagleragh, Booltiagh, Glenmore, Cahermurphy, Letteragh and Slieve Callan and the chimneys at Aughinish Alumina. The Cloonkett Wind Farm Aviation Review Statement also states further technical assessments and consultations may be required on certain aspects of the Proposed Development in relation to aviation, with a summary shown in *Table 16-4: Cloonkett Wind Farm Aviation Review Statement Summary*, below.

Table 16-4: Cloonkett Wind Farm Aviation Review Statement Summary

Item	Impact	Summary
Annex 14 – Obstacle Limitation Surfaces (OLS)	Subject to ANSP Review (T14 Unlikely to cause Impact)	*One of the proposed turbines (T14) at Cloonkett would be located inside the Outer Horizontal Surface (OHS). However, it should be noted that there are existing obstacles within the OHS and are marked on the IAA Air Navigation Obstacle Data Set (i.e. the chimneys at Aughinish Alumina).*
Annex 15 – Aerodrome Surfaces	Observ.	*The IAA are likely to request that turbines at the proposed wind farms be included in the IAA Aeronautical Electronic Obstacle Data Sets*
Building Restricted Areas (BRA)	None	*A review shows that Cloonkett is over 7 km from the BRAs at Shannon 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 within 25 nautical miles from the VOR/DME at Shannon Airport. The maximum allowable structure in the applicable sector is 2000 ft (AMSL).* *Turbines at the proposed wind farm would not exceed the 2000ft threshold, therefore the MSA of the applicable sector will not be affected and there will be no impact on the published MSA altitude figures*
Instrument Flight Procedures	Observ.	*A review shows that the instrument flight procedures for RWY 24 standard instrument departures may need to be assessed by the ANSP.* *Shannon Airport Authority \ IAA are likely to require a detailed assessment on the possible impact of turbines on the departure flight procedures for Runway 24*
Communication and Navigation Systems	None	*As the proposed wind farm is approximately 13 km from the Localizer and transmitting antenna at Shannon Airport, it is very unlikely that the proposed development will have any impact on these ATS communications and radio navigational aids.*
Shannon PSR	Observ.	*It has been identified that four of the proposed turbines would be within EuroControl Assessment Zone 2 for PSR.* *A detailed technical assessment was conducted against the proposed development. There are existing precedents of wind turbines that are within similar distances of PSR radars against which there are no impacts.*

Item	Impact	Summary
Shannon SSR	None	*Nine of the proposed turbines would be located within 16 km of the SSR at Shannon Airport. However, a review shows that reflected radar signals from the proposed turbines are unlikely to be detectable by an airborne transponder.* *It should also be noted that there are existing wind farm precedents that are located within 16 km of SSR radar stations (e.g. Carrownagowan, Fahy Beg and Boolyngleragh, Lackeragh) for which there are no impacts.*
Woodcock Hill SSR	None	*All of the turbines at the proposed development would be more than 16 km from the SSR and would be in Assessment Zone 4 (Eurocontrol Guidelines). i.e. No Assessment required.*
Flight Inspection and Calibration	Observ	*A review of the Flight Inspection Procedures indicates that there will be no impacts due to the proposed wind farm. However, the IAA may request that their Flight Inspection Service Provider (FCSL) be contacted so that they can assess the proposed development.*
Aeronautical Obstacle Warning Light Scheme	Observ	*It is possible that the IAA may request that the wind farm, if permitted, would be fitted with Aeronautical Obstacle Warning Lights in accordance with industry standards. Subject to further consultation with the IAA*
Irish Air Corps / DoD Safeguarding	None	*The proposed wind farm is located outside the Irish Air Corps Restricted Areas*
Garda Air Support Unit and Emergency Aeromedical Service	None	*An assessment of GASU and EAS operations indicates that they are unlikely to be impacted by the proposed wind farm development.*

16.6.7 Residual Effects

While further technical assessments and consultations may be required on certain aspects of the Proposed Development in relation to aviation, many of the effects identified are outlined within the Cloonkett Wind Farm Aviation Review Statement, with the effects identified within the Aviation Statement showing no residual effects on aviation as a result of the Proposed Development.

16.7 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 Vodafone operated microwave radio link was identified that could be impacted by the Proposed Development. Mitigation measures were implemented where turbines were moved and micro-sited 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 Cloonkett Wind Farm Aviation Review Statement focusing on potential impacts on radar systems, flight procedures, and obstacle limitation surfaces. It is considered that further technical assessment may be required, as one turbine location appears to penetrate the *Outer Horizontal Surface* of the Shannon Airport's obstacle limitation surfaces (OLS), however, AiBridges consider the turbines proximity to Shannon Airport, being at c. 14.88km west of the airport, as not posing significant threats to navigation or flight operations. 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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