

15 MATERIAL ASSETS

15.1 INTRODUCTION

This Chapter describes material assets that are potentially impacted by the project (please refer to section 2.3 of Chapter 2 for a full description of the project and the proposed development). The purpose of this assessment is to identify relevant material assets that are within the vicinity of the project site or will be utilised by the development, to determine the impact, if any, on these resources, and propose mitigation where necessary to ensure that they are used in a sustainable manner.

Elements of the project are discussed where relevant under appropriate sections of this chapter.

15.1.1 Scope of assessment

The following EPA publications were consulted as part of the preparation of this assessment.

- *Draft Guidelines on Information to be contained in environmental impact assessment reports (2017)*,
- *Advice Notes for Preparing Environmental Impact Statements (Draft 2015)* were also consulted.
- *European Commission Guidance on the Preparation of the Environmental Impact Assessment Report (2017)*.

Material assets are defined in the draft Advice Notes for Preparing Environmental Impact Statements (2015) as “Resources that are valued and that are intrinsic to specific places, are called material assets. They may be either of human or natural origin. The assessment shall be concerned primarily with ensuring equitable and sustainable use of resources”. **Table 15-1** outlines the topic areas which these guidelines suggest may be cross referenced as part of the Material Assets study.

Table15-1: Types of Material Assets

Topics for consideration
- Population and Human Health
- Water
- Air
- Soil and Geology
- Noise
- Vibration
- Climate

In consideration of material assets, the 2017 EC Guidance includes ‘buildings, other structures, mineral resources, water resources’. The definition of ‘Material Assets’ in the revised draft EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports published in August 2017, differs slightly to focus on built services and infrastructure and excludes material assets such as cultural heritage, land resource and air quality, which are covered by other topics in an EIAR. Under Material Assets, the draft guidelines lists Built Services, Roads and Traffic, and Waste Management. As recommended in the 2017 EPA Guidelines, the topic areas to be examined under Roads and Traffic and Built Services are outlined in Table 15.2.

Table 15.2 Material Assets and Topics to be included

Material Asset	Topics to be Covered
Roads and Traffic	Construction Phase Operational Phase Unplanned Events (i.e. Accidents)
Built Services	Electricity Telecommunications Water Supply Infrastructure Sewerage

Based on a review of the proposed development and the suggested topic areas set out in the Draft EPA guidelines (2017), the consideration of the projects impact on Material Assets provided within this Chapter is discussed in the context of built services. This includes transport infrastructure, electricity supply and infrastructure, telecommunications, aviation, water and wastewater infrastructure and waste management. In addition, having regard to the projects setting within an active forest plantation, commercial forestry resources have also been considered as a relevant material asset.

The majority of the other topic areas recommended for assessment under Material Assets are closely related to other sections of this EIAR and therefore reference should be made to the associated chapter as follows:

- Water resources are considered in the assessment on the surface water and groundwater resource provided in **Chapter 8, Water**. No further assessment on this topic is included in this chapter.
- The assessment on the land and geological resource is presented in **Chapter 9, Lands and Soils**. No further assessment on this topic is included in this chapter.
- The assessment on Cultural Assets is provided in **Chapter, 13 Cultural Heritage**. No further assessment on this topic is included in this chapter.
- Assimilative capacity of the air resource is considered in the assessment provided in **Chapter 14 Air and Climate Change**. No further assessment on this topic is included in this chapter.
- Traffic management is included within this chapter and in **Volume III, Appendix 3-4** Traffic Management Plan.

15.1.2 Methodology

The methodology used for this study included consultation and desk based research of published information on the relevant potentially impacted material assets and field work specific to the Traffic and Transportation Assessment.

This chapter has been prepared having regard to the following guidelines:

- *Guidelines on the Information to be contained in Environmental Impact Statements* (EPA 2002);
- *Revised Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (EPA, Draft 2017);
- *Advice Notes on Current Practices in the Preparation of Environmental Impact Statements* (EPA 2003);
- *Revised Advice Notes for Preparing Environmental Impact Statements* (EPA, Draft September 2015); and

- *European Commission Guidance on the Preparation of the Environmental Impact Assessment Report (2017).*

Traffic and Transportation Assessment included in the chapter has been prepared in the context of the following:

- Clare County Development Plan 2017-2023 (As Varied);
- The Transport Infrastructure Ireland (TII) Traffic and Transport Assessment (TTA) Guidelines PE-PDV-02045 May 2014;
- TII's Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections PE-PAG-02017 October 2016;
- TII's Rural Road Link Design DN-GEO-03031 June 2017; and
- The Environmental Protection Agency (EPA) Guidelines On The Information To Be Contained In Environmental Impact Assessment Reports Draft August 2017 (EPA EIAR Guidelines).

The Assessment includes the following:

- Existing and expected future road and transport network;
- Existing and predicted future baseline traffic volumes on the surrounding local road network;
- Predicted proposed development construction, operational and decommissioning traffic volumes and likely impacts; and
- Proposed mitigation measures.

15.1.3 Assessment Criteria

The significance and duration of predicted impacts have been defined in accordance with the EPA EIAR Guidelines, described under Methodology above.

15.2 EXISTING RECEIVING ENVIRONMENT

15.2.1 Transport Infrastructure

The proposed wind farm is located on the south side of the L8821-0 Local Road, south of Bodyke, as shown in Figure 15.1 below. The L8821-0 extends from Drummod in the west to the townland of Caherhurly in the east. Access to the proposed wind farm is provided from the L8821-0.

The L8821-0 forms a give-way junction where it joins with an adjacent local road and the R465 Regional Road at Drummod, approximately 2.3km west of the proposed site entrance. The L8821-0 has a typical road carriageway width of 3.0m. There are five residential properties along the L8821-0 from the junction with the R465 to the site entrance.

The R465 runs north-south, commencing at Bodyke and continuing south to Ardnacrusha via Drummod, Broadford and Kilmore. Approximately 2.2km north of its L8821-0 junction, it forms a stop controlled T-junction with the R352 Regional Road in Bodyke, within the 50 km/hour urban speed limit zone. The R465 has a typical rural road width of 5.5m. The R465 widens locally at the junction with the R352. There are SLOW road markings and school ahead warning signs on both sides of the approach to the Bodyke National School, which is located on the R465, approximately 155m south of its junction with the R352.

The L8821-0 and R465 rural roads within the vicinity of the proposed development are located within the 80 km/hour speed limit.

The R352 Regional Road has its junction with the R465 in the village of Bodyke. The R352 extends from Ennis to Portumna, via Spencilhill, Tuamgraney, Scarriff, and Mountshannon. The R352 has a typical carriageway width of 6.5m. From Bodyke, it continues south-west, where a 90 degree bend is present in the townland of Coolready. The R352 has numerous residential and farm accesses on both sides of the road. Local road access is provided in the form of a simple T-junction on both sides of the roads.

Approximately 16km west of Coolready, the R468 Regional Road forms a Stop controlled T-junction with the R352. Approximately 1.2km west of its R468 junction, the R467 Regional Road forms a Stop controlled T-junction with the R352.

McGrath Quarries is located on the north side of the R352, east of the townland of Fortane. It has two accesses from the R352. Directly east of the quarry, there is a crossroad junction between the R352, L4088 and L4086. A ghost island right turn lane is present on the R352 for access to both local roads. A left turn slip lane is present on the eastbound carriageway, to facilitate the turn from the R352 to the L4086.

The R352 continues east where it meets the R444 Regional Road. There is a ghost island right turn lane from the eastbound carriageway onto the R444, which forms a Stop controlled T-junction with the R352. SLOW road markings and a "Children Crossing" warning sign are present on both sides of the approach to Tulla GAA club. An informal red coloured crossing is marked on the carriageway. A hatched central road marking is present for approximately 120m at this location. The R462 forms a staggered crossroads with the R352 east of Tulla.

The R352 is used by the 348 Bus Eireann bus service which runs once a day between Ennis and Scariff.

Figure 15.1 Site location map



Figure 15.2 Local road network map



The grid connection route runs between the Carrownagowan wind farm and an existing substation in Ardnacrushna. The L8218 Local road is a gravel road less than 3.0m wide. The route continues in a southern direction along the L30302 Local road, which is approximately 3.5m wide and goes through the village of Kilbane. The route then travels south along the L7004 Local road which is approximately 3.5m wide. After this the route will meet the R466 Regional road which runs between Tulla and O’Briensbridge. The R466 is approximately 7.3m wide on the length of the grid connection route. The grid connection route then continues south on the L3004 Local road, which varies between 4.0m and 5.5m. After approximately 4.2km, it meets the R471 Regional Road, where it forms a Stop controlled crossroads. At this crossroads (Harols Cross), the route travels west along the R471 for a distance of

2.6km. The R471 is approximately 5.5m wide throughout the length of the route. It meets the R465 Regional road and forms a Stop controlled crossroads as the minor arm. There are a number of residential accesses in the vicinity of the crossroads. The grid connection route continues east along the R471, turning south onto the L-70661 Local road. The L-70661 is approximately 3.0m wide with a gravel surface. It joins the L-7066 Local road and continues for a distance of 0.7km south until it reaches the L-3054 Local road. The L7066 has an asphalt surface and is approximately 5.0m wide. The L-3054 is approximately 6.0m wide and has a number of residential accesses along the route. The L-3054 meets the L-3056 Local road within a 60 km/hour urban speed limit. From here the grid connection turns south to enter the Ardnacrusha 110kV substation.

On-site classified road traffic volumes were recorded by Malachy Walsh and Partners on Friday 23rd November 2018, adjacent to the proposed development site on the R352 Regional road. These were factored on the basis of TII’s automatic traffic counter data to establish typical 2019 peak hour and Annual Average Daily Traffic (AADT) volumes for the latest full year, 2018, on the local rural road network. The factored typical baseline traffic volumes are provided in Table 15.3. These are total two-way vehicles at the road locations identified. The volumes of peak hour Heavy Goods Vehicles (HGVs) and the proportions (%) of AADT HGVs are also provided.

Table 15.3: Existing Traffic Volumes

Road Location	Total Vehicles (HGVs)	
	2019 Peak Hour	2018 AADT (% HGVs)
R352	840 (47)	2,205 (13.1%)
R465 at L8821-0	363 (19)	3365 (3.2%)
L8821-0	47 (1)	>500 (1%)

The rural road link capacity of the R352 within its 80 km/hour rural speed limit zone, estimated on the basis of the TII Rural Road Link Design DN-GEO-03031 June 2017, for its typical road carriageway width of 7.3m is provided in Table 15.4. The TII rural road link capacity is an AADT capacity.

Table 15.4 Estimated R352 TII Rural Road Link Capacity

R352 80 km/hour Rural Road	TII Rural Road Link		
	Type	Carriageway Width (m)	AADT Capacity (Vehicles)
R352 at Spancil Hill	Type 1 Single	7.3	11,600

The estimated existing rural road link AADT volume/capacity ration for the R352 in the vicinity of the proposed development site is provided in Table 15.5, on the basis of the TII Rural Road Link Design DN-GEO-03031 June 2017, for the latest full year 2018.

Table 15.5 Estimated R352 TII Rural Road Link 2018 AADT Volume/Capacity Ratio

R352 80 km/hour Rural Road	2018 AADT Vehicles	AADT Capacity (Vehicles)	AADT Volume/Capacity Ratio
R352	8,065	11,600	70%

The R352 is operating within its estimated rural road link AADT capacity, with a 2018 volume/capacity ration of 70%.

The rural road link capacity of the R465 within its 80 km/hour rural speed limit zone, estimated on the basis of the TII Rural Road Link Design DN-GEO-03031 June 2017, for its typical road carriageway width of 6.0m, is provided in Table 15.6. The TII rural road link capacity is an AADT capacity.

Table 15.6 Estimated R465 TII Rural Road Link Capacity

R465 80 km/hour Rural Road	TII Rural Road Link		
	Type	Carriageway Width (m)	AADT Capacity (Vehicles)
R465 at Bodyke	Type 3 Single	6.0	5,000

The estimated existing rural road link AADT volume/capacity ration for the R352 in the vicinity of the proposed development site is provided inTable 15.7, on the basis of the TII Rural Road Link Design DN-GEO-03031 June 2017, for the latest full year 2018.

Table 15.7 Estimated R465 TII Rural Road Link 2018 AADT Volume/Capacity Ratio

R465 80 km/hour Rural Road	2018 AADT Vehicles	AADT Capacity (Vehicles)	AADT Volume/Capacity Ratio
R465	3365	5,000	67%

The R465 is operating well within its estimated rural road link AADT capacity, with a 2018 volume/capacity ration of 67%.

The proposed turbine delivery route has been assessed from both Galway and Foynes ports to the site. The turbine component delivery vehicles are included in the traffic assessment within this chapter, while the route itself is summarised in Chapter 2 and detailed in the Turbine Delivery Route Assessment in Appendix 3-7 of Volume III. The required, temporary, removal of signs and other street furniture are minor, short term, insignificant works which will be agreed with Clare County Council and Transport Infrastructure Ireland. These works are not considered further in this chapter.

15.2.2 Forest Resources

Forests are an important renewable resource with a role to play in sustainable rural economic development. Available data indicates that approximately 17.2 % of Co. Clare’s land area is under forestry, of which nearly three quarters is conifers and one quarter broadleaves¹. Timber production

¹ DAFM Forestry Statistics Ireland 2019

is the principal objective and economic benefit of the county's forest resource. The county's Forestry resources are also recognised as having a role to play in recreation in rural areas and have the potential to make an important contribution to the tourism offering in the County. Many visitors and members of the local community use forests for recreation such as walking, running, bird-watching and mountain-biking and many trails and amenities have been developed for such activities².

The proposed wind farm development lands are located predominately within existing commercial conifer forest that is owned and managed by Coillte, the Irish State Forestry Board, for timber production. There are two dominant tree species across the site. These include the Lodgepole pine and Sitka Spruce. The plantation is certified to the Forest Stewardship Council (FSC) scheme and the PEFC Council (Programme for the Endorsement of Forest Certification schemes), which demonstrates that it is well managed in accordance with strict environmental, social and economic criteria.

The plantation falls within Coilltes Mid West Business Area Unit (BAU) Strategic Plan. The Mid West BAU, which is one of 6 BAU's in Coillte, covers all areas of County Galway and County Clare. The BAU Strategic Plan sets out the economic, social and environmental strategies and priorities for the long and medium term in the BAU. The Mid West BAU consists of 70,222 ha of mostly good productive forest land and also Farm Partnerships. Forest properties are widespread throughout the BAU, with greatest forest area (approximately 20,000 ha's) being located in the Slieve Aughty mountains and Slieve Bernagh.

There are currently no defined recreational or tourism amenities within or associated with the plantation. The nearest forest offering recreational amenities are situated on Crag Hill (including Ballycuggaran) on the lower slopes of the Slieve Bernagh Mountains overlooking Lough Derg. There are 3 way marked trails in this forest – one is a moderate looped walk called the Crag Wood Walk and this trailhead also gives access onto the East Clare Way. A new trail was constructed in 2016 which allows visitors to access Moylussa, the highest point in county Clare.

15.2.3 Grid Capacity and Electrical Infrastructure

EirGrid is the national electricity Transmission Systems Operator (TSO) in Ireland. In its role as TSO, EirGrid is responsible for the grid infrastructure required to support the development of Ireland's economy. EirGrid's Transmission Development Plan (TDP) 2018-2027 is the plan for the development of the Irish transmission network and interconnection over the ten years from 2018. This ten year plan presents projects that are needed for the operation of the transmission network. The Grid developments have been planned to ensure that the intended grid reinforcements facilitate the connection of significant amounts of wind generation.

The plan sets out a number of planned reinforcement projects of the Transmission Network in Clare including redevelopment of the 110 kV Station at Ardnacrusha. The development strategy has stated that it is vital that this new electricity infrastructure is built to ensure that the region meets the standards required for a safe and secure electricity system and to cater for connecting the electricity generated by the region's huge renewable energy resources.

² Clare County Development Plan 2017-2023

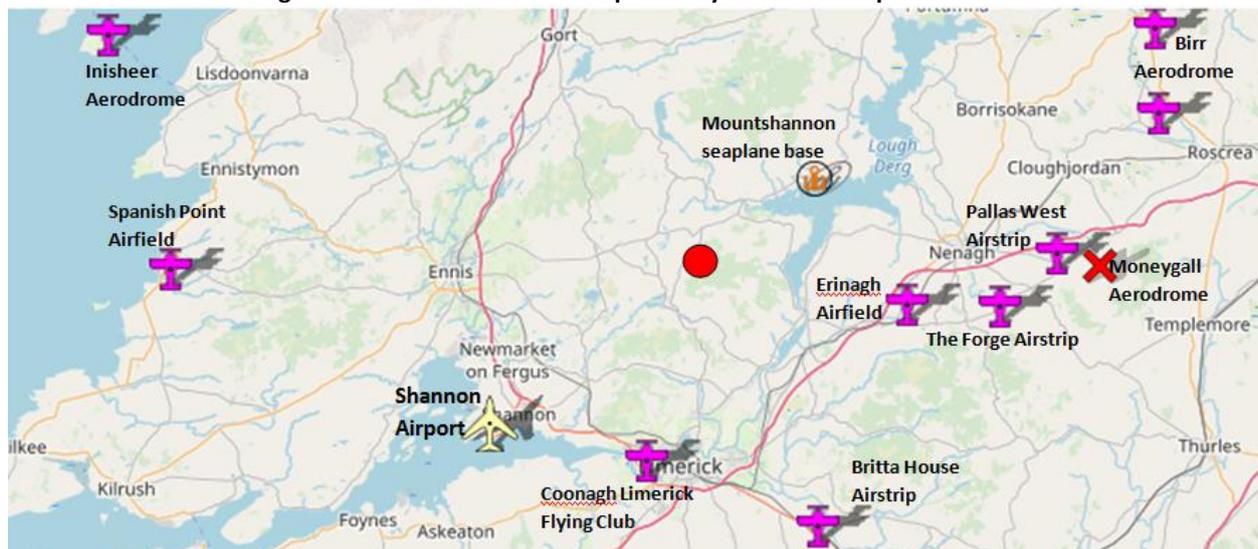
Ardnacrusha 110kV Substation is situated within the property of Ardnacrusha Power Station located at Parteen close to the Limerick Clare border. The 110kV substation has recently been upgraded to a new 110kV GIS busbar. There are currently four 110kV feeders which should allow enough MW capacity for a 110kV generation connection. The grid connection package, which outlines detail of the project's grid connection, is in Volume III, Appendix 2-2.

15.2.4 Aviation

Airports are valuable transport, tourism, employment, and business assets for the local and national economy. The development of large energy projects has the potential to impact air service and operations (airports, landing strips, etc.) within a project area. Developments around airports and under flight-paths can constrain operations, either directly where they conflict with safety/operational requirements, or indirectly where they interfere with radar or other navigational aids.

Shannon Airport, one of Ireland's main international Airports and important state economic asset, is located circa 28km south west of the proposed wind farm development site. A desk base review indicates that there are also numerous aerodromes and airfields in the surrounding region.

Figure 15.3 Aviation facilities in proximity to the development site



Source: <https://ourairports.com/countries/IE/>

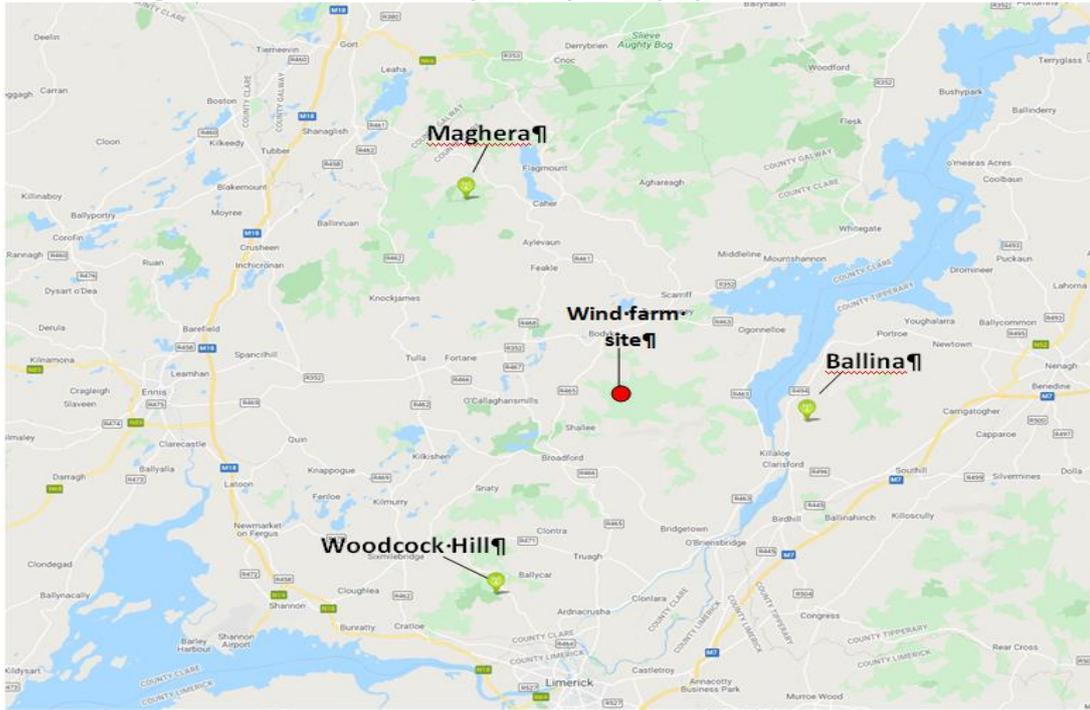
15.2.5 Television and Telecommunications

RTE's analogue service was turned off in October 2012 and was replaced by a new Digital Terrestrial Television (DTT) service, commonly known as Saorview TV. The digital Saorview service is still provided from the large RTE transmission sites and a number of new transmission sites have also been built. A review of the Saorview coverage map indicates that TV reception in the area is principally received from the following transmitters:

- Areas north and west of the site primarily receive TV reception from the northwest via the transmitter at Maghera, County Clare. There are some locations however, including Feakle receiving reception from the south via the 2RN Transmitter at Mullaghanish, Co. Cork.
- Areas south and southeast of the site primarily receive TV reception from the southeast via the transmitter at Woodcock Hill, County Clare or the transmitter at Mullaghanish, Co. Cork.
- Areas to the east of the site primarily receive TV reception from the east via the transmitter at Ballina, County Clare

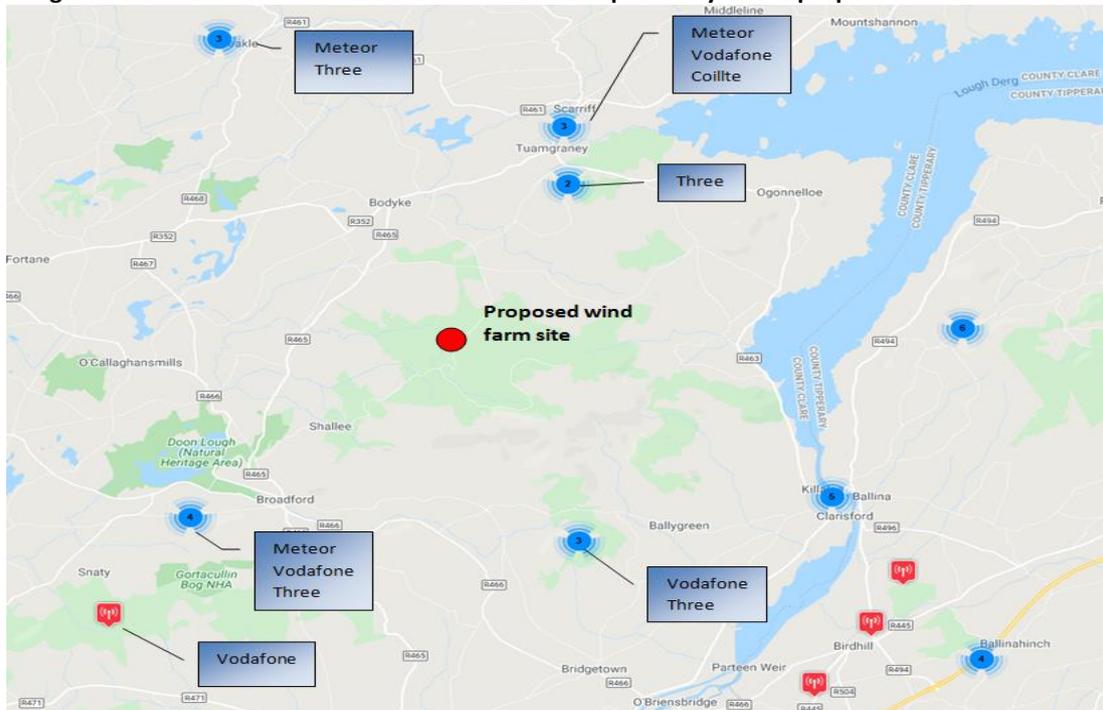
The Saorview coverage map also indicates that SAORVIEW coverage is currently a challenge in some areas south of the development site, including in the vicinity of Broadford, Clongaheen west, Kilbane.

Figure 15.4 TV transmitters in proximity to the proposed wind farm site



A review of the Commission for Communications Regulation site map provides that Mobile network operators with masts and communication links in the area include Vodafone, Three and Meteor.

Figure 15.5 Known communication infrastructure in proximity to the proposed wind farm site



Source: <https://siteviewer.comreg.ie/#explore>

15.2.6 Water and wastewater infrastructure

There is currently no wastewater or water supply infrastructure within the subject site.

15.2.7 Waste Management

There is currently no waste or construction phase waste infrastructure within the subject site.

15.3 LIKELY SIGNIFICANT EFFECTS

15.3.1 Transport Infrastructure

15.3.1.1 Do nothing impacts

The roads and transportation objectives and policies of Clare County Council are set out in the Clare County Development Plan 2017-2023 (As Varied).

It is the objective of Clare County Council to upgrade and improve, where necessary the Regional Roads in the County as outlined in the County Development Plan.

The Council have selected the R352 and R465 as strategic routes that act as feeder routes based on the volumes of traffic that they carry on a daily basis. The Council will protect the identified strategic regional roads from a proliferation of access points and will ensure their key function is retained.

Subject to planning permission, it is envisaged that work would commence at the site during late 2022, with duration of approximately 18 months. Accordingly, the proposed development is scheduled to be fully complete and operational by the end of 2023. The TII Traffic and Transport Assessment Guidelines recommend that the opening year of a development proposal and plan years, five and 15 years after the opening year, should be considered for assessing a development proposal. In this case, the opening year is 2023 and the plan years are 2028 and 2038.

TII in their Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections October 2016 envisage that car and light vehicle volumes on Ireland Mid-West national roads, including Clare, would increase by an annual factor of 1.0110 during the period to 2030, and by a factor of 1.0242 for heavy vehicles, based on their high sensitivity growth scenario. The equivalent factors for the period 2030 to 2050 are 1.0018 and 1.0195.

The predicted peak hour and AADT traffic volumes on the L8821-0 and R465, adjacent to the proposed development site and the R352, with the foregoing TII predicted high sensitivity growth scenario are provided in Table 15.8.

Table 15.8 Predicted Traffic Volumes with TII High Growth

Road Location	Year	Total Vehicles (HGVs)	
		Peak Hour	AADT (% HGVs)
R352 at Spencil Hill	2023	919 (53)	8518 (4.6%)
	2028	971 (60)	8997(5.2%)
	2038	1006 (73)	9330 (6.4%)
R465	2023	383 (21)	3554 (3.6%)
	2028	405 (24)	3754 (4.1%)
	2038	420 (30)	3893 (5.0%)
L8821-0	2023	50 (4)	528 (1.1%)
	2028	52 (4)	558 (1.3%)
	2038	54 (5)	578 (1.6%)

The estimated rural road link AADT volume/capacity ratios for the R352 and R465 in the vicinity of the proposed development site are provided in Table 15.9 and

Table 15.10, on the basis of the TII Rural Road Link Design DN-GEO-03031 June 2017 for the predicted years 2023, 2028 and 2038 AADT volumes with the TII high grown scenario, without the proposed development.

Table 15.9 Predicted R352 TII Rural Road Link AADT Volume/Capacity Ratios with TII High Growth

R352 80 km/hour Rural Road	Year	AADT Vehicles	AADT Capacity (Vehicles)	AADT Volume/Capacity Ratio
R352	2023	8,518	11,600	73%
	2028	8,997		78%
	2038	9,330		80%

Table 15.10 Predicted R465 TII Rural Road Link AADT Volume/Capacity Ratios with TII High Growth

R465 80 km/hour Rural Road	Year	AADT Vehicles	AADT Capacity (Vehicles)	AADT Volume/Capacity Ratio
R465	2023	3,554	5,000	71%
	2028	3,754		75%
	2038	3,893		78%

The R352 and R465 would continue to operate within its estimated rural road link AADT capacity for the predicted 2023, 2028 and 2038 AADT volumes on the basis of the TII high growth scenario, with a highest volume/capacity ratio of 80% in 2038.

15.3.1.2 Construction Phase Impact

A detailed description of the proposed development construction is provided in Chapter 2. Subject to planning permission, the proposed construction works would commence on site in 2022. The construction phase is expected to last approximately 18 months, and would be completed during 2023.

15.3.1.2.1 Access and vehicle routing

The routing for the delivery of the wind farm components is summarised in Chapter 2 and detailed in Appendix 3-7 Turbine Delivery Route Assessment.

It is proposed to upgrade the existing entrance to Coillte land on the L8221-0 to accommodate the size of the trucks required for turbine delivery. This upgrade will accommodate all traffic movements associated with the construction and operation of the wind farm.

The L8221-0 will require widening for its entire length from the junction of the R465 through to the site entrance, from its existing 3.0m to 4.5-5.0m throughout. The carriageway will be permanently widened with a verge, open drain and new boundary fence. It is envisaged that Clare County Council will carry out the road widening and strengthening works on the L-8821 Local road which will be funded by the developer.

All construction materials will be delivered through the entrance off the L8221-0. All deliveries vehicles will travel to and from the proposed development via the R465, south of Bodyke and the L8821-0. The R352 and R465 meet in Bodyke village and the turning manoeuvres for turbine blade delivery are not feasible. A new section of road is required approximately 450m to the south of Bodyke to access the R465 from the R352. This will require the construction of new temporary entrances on the R352 and R465. All waste management vehicles will be scheduled and use the entrance off the L8221-0. Vehicle movements relating to the removal of waste and wastewater will be infrequent and have been accounted for in the overall number of heavy vehicles in Table 15.11 below (36/12,030 trips).

The temporary entrances will be constructed in line with TII Rural Road Link Design DN-GEO-03031 June 2017 and TII Geometric Design of Junctions DN-GEO-03030 April 2017, ensuring that the visibility requirements are adhered to. A simple priority junction will be provided, as the proposed minor road traffic flows will consist of the turbine delivery vehicles. If required, traffic management and personnel will be provided at the junction during the deliveries, in accordance with requirements of Clare County Council and An Garda Síochana to ensure the safety of other road users. At the end of construction, the entrances will be reinstated and the boundary reinstated in its original position.

The R352 Regional road will require road widening on a section in the townland of Coolready, approximately 1.1km southwest of Bodyke village to accommodate the turbine delivery vehicles. It is intended that on completion of the widening works, a temporary barrier (such as anchor blocks) will be put in place along the road verge, thus keeping the public carriageway as existing. On the day of the turbine delivery, the anchor blocks would be pulled back to allow the trucks through and reinstalled again after. At the end of construction the ground will be reinstated and the boundary fence re-established at its original location.

The majority of materials for delivery to site will be sourced from local quarries. These are likely to include McGrath Quarries, located on the R352 approximately 7.5km west of Bodyke and other existing quarries east and south of Bodyke. Construction materials' delivery vehicles routes are likely to include the R352, R465 and R466 south of Bodyke.

15.3.1.2.2 [Hours and staff](#)

The proposed on site working for the construction works are between 7.00 a.m. and 7.00 p.m. subject to seasonal variations and shorter working days in winter. Work is normally undertaken on a five or six day week including Saturdays, depending on the contractors programme, weather and availability of resources.

Delivery of oversized wind turbine components will occur outside of these times to minimise traffic nuisance and in line with typical abnormal loads licence conditions imposed by the various granting authorities.

Site personnel will travel to site prior to 7.30 a.m. and depart from site from 6.30 p.m., on weekdays, outside the peak traffic hours. The expected peak staff would be up to 75 personnel, who would generate approximately 75 car and van trips, both to and from the site each working day, on the basis of an average worst case vehicle occupancy rate of 1.0 personnel per vehicle. Canteen facilities for personnel would be provided on-site.

15.3.1.2.3 Delivery vehicle volumes

All construction excavated material would be retained on-site.

The 18 months construction would require the importation of up to 11,350 loads of construction materials. This would include delivery vehicles for the 19 wind turbines including their abnormal loads. All other construction materials would be imported using standard heavy vehicle delivery trucks with capacities of 10 m³ and 20 tonnes.

The proposed construction works heavy vehicle delivery traffic volumes are provided in Table 15.11.

Table 15.11 Proposed Construction Works Heavy Vehicle Delivery Traffic Volumes

Works	Total Number of Heavy Vehicles		
	Total Construction Programme (12 months) ⁽²⁾	Peak Daily	Highest Peak Hour
Tree felling	680	10	3
Wind farm	6,450	90 ⁽¹⁾	12 ⁽¹⁾
Grid Connection	4,650	18	3
Substation	250	5	3
Total	12,030	90⁽¹⁾	12⁽¹⁾

Note ⁽¹⁾: During base concrete pours. Other deliveries to site would be curtailed or stopped during concrete pours.

Note ⁽²⁾: For the purpose of the analysis, truck movements are conservatively assumed to occur within a 12-month period, during which more onerous construction elements are taking place.

The wind turbine loads would be delivered in consultation with Clare County Council, Galway County Council or Limerick City and County Council and An Garda Síochana, during off-peak traffic periods. A total of 190 delivery vehicles will be required for the 19 turbines. This could result in temporary delays for other location traffic during the off peak traffic delivery periods.

Peak heavy vehicle traffic volumes generated by the delivery of construction materials would be up to 90 heavy vehicles per day, both to and from the site. This would occur on 19 separate days during the concrete pours for the turbine bases. Other deliveries to site would be curtailed or stopped during concrete pours. Highest peak hour heavy vehicle traffic volumes would be up to 12 heavy vehicles, both to and from the site.

15.3.1.2.4 Traffic volumes

The predicted average annual daily traffic volumes, peak daily traffic volumes and highest peak hour traffic volumes generated by the proposed development construction are provided in Table 15.12.

The predicted AADT volumes are based on a 12 months construction programme, which would have higher increases in AADT volumes than an 18 months construction programme which more onerous construction elements are taking place.

Table 15.12 Proposed Construction Works Traffic Volumes

Total Vehicles (HGVs)		
AADT (% HGVs)	Peak Daily	Highest Peak Hour
196 (24%)	330 (180)	24 (24)

The predicted 2023 peak daily and peak hour traffic volumes on the existing local roads with the proposed peak construction works traffic volumes are provided in Table 15.13 and Table 15.14 respectively.

Table 15.13 Predicted 2023 Traffic Volumes with Peak Daily Construction Traffic Volumes

Road Location	Peak Daily Vehicles (HGVs)	
	Total Vehicles (HGVs)	Change
R352 at Spencil Hill	8,848 (555)	+330 (180)
R465	3,884 (308)	+330 (180)
L8821-0	858 (186)	+330 (180)

Table 15.14 Predicted 2023 Traffic Volumes with Peak Hour Construction Traffic Volumes

Road Location	Peak Hour Vehicles (HGVs)	
	Total Vehicles (HGVs)	Change
R352 at Spencil Hill	943 (77)	+24 (24)
R465	407 (45)	+24 (24)
L8821-0	74 (28)	+24 (24)

15.3.1.2.5 Volume/Capacity ratios

The estimated rural road link AADT volume/capacity ratio for the R352 in the vicinity of the proposed development site is provided in Table 15.16 on the basis of the TII Rural Road Link Design, for predicted 2023 AADT volumes with the TII high growth scenario, with the proposed construction development.

Table 15.15 Predicted 2023 R352 TII Rural Road Link AADT Volume/Capacity Ratio with TII High Growth and Peak Construction Traffic

R352 80 km/hour Rural Road	AADT Vehicles	AADT Capacity (Vehicles)	AADT Volume/Capacity Ratio
R352	8,848	11,600	76%

The R352 would continue to operate within its estimated rural road link AADT capacity, for the predicted 2023 AADT volumes on the basis of the TII high growth scenario and the proposed construction traffic volumes, with a volume/capacity ratio of 76%. This compares to a ratio of 73% without the proposed development.

The estimated rural road link AADT volume/capacity ratio for the R465 in the vicinity of the proposed development site is provided in Table 15.16, on the basis of the TII Rural Road Link Design, for predicted 2023 AADT volumes with the TII high growth scenario, with the proposed construction development.

Table 15.16 Predicted 2023 R465 TII Rural Road Link AADT Volume/Capacity Ratio with TII High Growth and Peak Construction Traffic

R465 80 km/hour Rural Road	AADT Vehicles	AADT Capacity (Vehicles)	AADT Volume/Capacity Ratio
R465	3,884	5,000	78%

The R465 would continue to operate within its estimated rural road link AADT capacity, for the predicted 2023 AADT volumes on the basis of the TII high growth scenario and the proposed construction traffic volumes, with a volume/capacity ratio of 78%. This compares to a ratio of 71% without the proposed development.

15.3.1.2.6 Traffic Management – single lane closures – Grid connection construction works

A detailed description of traffic management required for the proposed development is provided in the Traffic Management Plan (Appendix 3-4, Volume III).. Single lane closures will be required as part of the grid connection construction works. It is envisaged that 100-200m of the cable route will be construction each day and therefore single lane closures will move with the works. The Single lane closure will be controlled by way of either a stop-go system, a priority yield system or by temporary traffic lights.

Details of the single lane closures are to be confirmed at the construction stage. At this stage, it is considered that the following roads will have single lane closures during the construction of the cable route with approximate lengths shown:

Regional Roads in County Clare

- R466: The L-3022 / R466 junction at Ballyquin Beg to the R466 / L-3044 junction at Springmount (900 metres)
- R471: Harols Cross Roads to the R466 / L-70661 junction at Cloghera (1.8 kilometres)

Local Roads in County Clare

- L-3054-0: Glenlon South to the L-3054 / L-3056 junction at Lakyle (900 metres)
- L-3056-0: The L-3054 / L-3056 junction at Lakyle to the Ardnacrushna Power Station at Castlebank (200 metres)

15.3.1.2.7 Traffic Management – road closures – Delivery route & Grid connection route

A detailed description of traffic management required for the proposed development is provided in the Traffic Management Plan (Appendix 3-4, Volume III). It is proposed that the following roads will have road closures during the required widening works with approximate lengths shown:

- L-8221-0: The R465 / L-8221 junction at Drummod to the L-8221 / L-8218 junction at Caherhurly (2.9 kilometres)
- L-8218-0: Caherhurly to Killokennedy (700 metres)

Diversions will be implemented to provide an alternative route for road closures during construction. For the L8821-0 a diversion is to be made via the R465 Regional road, the R352 Regional road and the L-8218 Local road (6.4km). For the L8218-0, a diversion is not required as the section of road subject to a road closure is on a cul-de-sac. The road closures and associated diversions are to be confirmed at construction stage.

It is proposed that the following roads will have road closures during the construction of the grid connection cable route with approximate lengths shown:

Proposed Regional Road Closure in County Clare

- R471: R465 / R471 Junction to the R471 / L-3048 junction at Cloghera (800 metres)

Proposed Local Road Closures in County Clare

- L-8218-0: Caherhurly to Killokennedy (700 metres)
- L-30302-0: The L-3030 / L-30302 junction at Violethill to the L-30302 / L-7004 junction at Cloongaheen West (5.0 kilometres)
- L-7004-17: The R465 / L-7004 junction at Broadford to Kilbane (5.0 kilometres)
- L-3022-8: Kilbane to the L-3022 / R466 junction at Ballyquin Beg (2.4 kilometres)
- L-3044-0: The R466 / L-3044 junction at Springmount to Harols Cross Roads (4.2 kilometres)
- L-70661-0: The R466 / L-70661 junction at Cloghera to the L-70661 / L-7066 junction at Trough (1.3 kilometres)
- L-7066-0: The L-70661 / L-7066 junction at Trough to the L-7066 / L-3054 junction at Roo West (700 metres)
- L-3054-0 (1st Section): The L-7066 / L-3054 junction to the L-3054 / L-3052 Junction at Roo West (600 metres)
- L-3054-0 (2nd Section): The L-3054 / L-3052 Junction at Roo West to Glenlon South (600 metres)

Diversions will be implemented to provide an alternative route for road closures during construction. These will be confirmed during the construction stage. Advanced engagement will take place with all residents and landowners to ensure the least disruption.

- L-8218-0: Diversion not required as section of the L-8218 Local road subject to a road closure is on a cul-de-sac
- L-30302-0: Diversion to be made via the L-3030 Local road, the R465 Regional road and the L-7004 Local road in County Clare (4.2 kilometres)
- L-7004-17: Diversion to be made via the R465 Regional road, the R466 Regional road and the L-3022 Local road in County Clare (5.8 kilometres)
- L-3022-8: Diversion to be made via the L-3022 Local road and the R466 Regional road in County Clare (3.4 kilometres)
- L-3044-0: Diversion to be made via the R466 Regional road, the R463 Regional road and the R471 Regional road in County Clare (11.7 kilometres)

- R471: Diversion to be made via the R465 Regional road and the L-3048 Local road in County Clare (1.5 kilometres)
- L-70661-0: Diversion to be made via the R471 Regional road and the L-7066 Local road in County Clare (3.0 kilometres)
- L-7066-0: Diversion to be made via the L-70661 Local road, the R471 Regional road, the L-3048 Local road, the R465 Regional and the L-7068 Local road in County Clare (4.2 kilometres)
- L-3054-0 (1st Section): Diversion to be made via the L-7068 Local road, the R465 Regional road and the L-3052 Local road in County Clare (4.0 kilometres)
- L-3054-0 (2nd Section): Diversion to be made via the L-3052 Local road, the R465 Regional road, and the L-3056 Local road in County Clare (2.3 kilometres)

15.3.1.2.8 [Road pavements](#)

Heavy vehicle traffic volumes generated by the proposed development construction could result in damage to existing and proposed road pavements on public roads, including at vehicle turning, accelerating and decelerating locations. Road pavements would be regularly monitored and reinstated in accordance with the requirements of Clare County Council.

15.3.1.2.9 [Impact summary](#)

On the basis of the EPA Guidelines, the proposed construction works would have slight to moderate short-term negative effects.

15.3.1.3 [Operational phase impact](#)

During the operational phase, there will be periodic maintenance on site. This would generate a relatively low volume of vehicles, including occasional heavy vehicles.

On the basis of the EPA Guidelines, the proposed operational phase would have imperceptible to not significant traffic effects.

15.3.1.4 [Decommissioning Phase impacts](#)

A description of the decommissioning phase is provided in Chapter 2. The removal of the wind turbines during any decommissioning phase would be on a similar basis to the delivery of the wind turbines for the construction phase, with similar traffic volumes and impacts. Therefore the proposed decommissioning works would have slight to moderate short-term negative effects.

15.3.2 [Forest Resources](#)

The main impact on the existing forest resource will be the requirement for permanent tree felling to facilitate the wind turbines and associated infrastructure so that both energy and timber production can occur on the site. Overall felling of appropriately 67.66ha of forest will be required. This represents approximately 0.3% of the forest resource in the area locally. Therefore the amount of forest that will be lost as a result of the development is minimal and will be insignificant relative to the size of the forest resource nationally, regionally and locally.

Notwithstanding this, in accordance with felling licence requirements for the planting of trees to **replace** those felled, replacement forest for all forest removed as part of the proposed development will be undertaken. This is to occur at three off-site locations, namely Ballard in Co Wicklow,

Dangananella West, Cooraclare in Co. Clare and Turraheen in Co. Tipperary. These proposed replacement forestry lands have previously been granted Technical Approval by the Forest Service for afforestation. Therefore the proposed development will have a negligible impact on the national forest resource.

Conventional felling has taken place and will continue to take place at the site independent of the wind farm proposal. This felling has and will continue in accordance with strict environmental guidelines including the Forestry Guidelines (Department of Agriculture, Food and the Marine, 2019, Standards for Felling and Reforestation). However, no forest operations will take place during the construction of the wind farm. Coillte must adhere to strict environmental conditions in order to maintain its Forest Stewardship Council (FSC) Certification and the PEFC Council (Programme for the Endorsement of Forest Certification schemes). Any felling to facilitate the wind farm construction and operation will continue to operate within the safeguards set out in these guidelines. Similarly replanting activities will be undertaken in accordance with FSC and PEFC Certification practices. Therefore no significant negative effects on the receiving environment will occur.

The wind farm development would not impede or deter either existing or future use of the local forest resources for recreational activities. It is likely that the improvements to the on-site forest tracks would provide opportunities for further development and use of some of the forest areas for recreation. Therefore, there will be no significant negative effects on the local forest resources for recreational use.

15.3.3 Grid Capacity and Electrical Infrastructure

The Carrownagowan wind farm project will complement the national grid development strategy and help in contributing to the regions expected overall wind generation. The proposal will assist in meeting increases in electricity demand nationally by exporting electricity into the electricity market. It will contribute to ensuring that adequate electricity supplies are available to support economic activity and growth in a manner fully compatible with Government energy and environmental policies.

The wind farm proposal does not pose a risk to the local electricity infrastructure. There is currently sufficient capacity and infrastructure in place to accommodate the additional renewable energy to be generated.

15.3.4 Aviation

Following consultation, the Irish Aviation Authority expressed concern that due to the size and location of the proposed wind farm, there was potential that the wind farm could adversely affect the radiated signal and Instrument Landing System (ILS) for Runway 24 at Shannon Airport.

A navigational aids assessment was subsequently undertaken by PagerPower to determine whether the proposed wind farm development would adversely affect aircraft using the ILS. Refer to Volume III, Appendix 15-1.

The results of the assessment determine that the horizontal clearance between aircraft flying the test trajectories and the turbines is more than six times the minimum horizontal clearance distance of 150

metres applicable for VFR flights in Ireland. The proposed turbines will therefore not affect aircraft flying ILS test trajectories and will therefore not have a significant impact on ILS test flights.

Following completion of the assessment, the PagerPower report was shared with the Irish Aviation Authority.

15.3.5 Television and Telecommunications

It is unlikely, given that the wind farm does not appear to be located between receptors and TV transmitters, that receptors in the vicinity of the wind farm could experience interference with television reception. Notwithstanding this, as is standard practice, a signed Protocol between the developer and RTE will be in place, in which the developer will be responsible to resolve any issue of interference with television reception as a result of the proposed development.

Based on information received from during the consultation, Netshare indicated that there would be no likely impact to Vodafone services in the area as a result of the proposed wind farm development. Similarly, Eir, Three, Imagine, Ivertex and Virgin confirmed there would be no impact in the area. While the main service providers responded, not all providers contacted did and subsequently it is not conclusive in determining if certain communication links are likely to be affected by the proposed wind farm. Notwithstanding this, it is considered unlikely and anticipated that any potential interference with links can be suitably overcome. Therefore, significant effects on telecommunication assets are not expected. Suitable mitigation, if required, would need to be carried out in consultation with the operations provider.

15.3.6 Water and wastewater infrastructure

No public water or wastewater utility infrastructure is required at the wind farm site.

Water needs for construction activities will be low and limited to truck washing, wheel wash, dust suppression and sanitary facilities. It is proposed that this water requirement will be sourced from on-site rainwater collection systems and settlement ponds. It is estimated that up to approximately 3,000 litres per day of potable water will be required during peak construction for construction employees. It is proposed that this water requirement will be imported in bulk water tanks. Potable water for during the operational and maintenance phase is estimated to be approximately 60 litres. This water will be supplied as bottled water. The volumes of water required are minimal and would have a negligible impact on the water supply utilities.

During the construction time period, sanitary wastewater, estimated to be 3,000 litres per day, will be collected in portable toilets during construction. Disposal of sanitary wastes will be managed through a contract with a licenced waste contractor. During the operational phase, wastewater from welfare facilities on site, estimated to be approximately 60 litres per day, will drain to integrated wastewater holding tanks associate with the toilet units. The stored effluent will then be collected on a regular basis from site by a permitted waste contractor and removed to a licenced waste facility for treatment and disposal. The volumes of wastewater requiring disposal are minimal and would have a negligible impact on the capacities of external treatment facilities. The vehicle movements required for removal of wastewater have been accounted for in the in the overall traffic number in section 15.3.1. Two such facilities in Co. Clare include Shannon Wastewater Treatment Plant and Quin Wastewater Treatment Plant.

15.3.7 Waste Management

Construction phase waste may consist of hardcore, concrete, spare steel reinforcement, cable wires, shuttering timber and building materials. This waste will be stored in the construction compound and collected at the end of the construction phase and taken off site to be reused, recycled and disposed of in accordance with best practice procedures at an approved facility. Plastic waste will be taken for recycling by an approved contractor and disposed or recycled at an approved facility. Hazardous materials, such as fuels and lubricant oils, used during construction that require disposal will be disposed of in accordance with all applicable laws and regulations. Domestic type waste generated by contractors will be collected on site, stored in an enclosed skip at the construction compounds and disposed of at a licensed landfill facility.

There is an approved facility located in nearby Tuamgraney which is operated by Clare Waste and Recycling Ltd., a permitted waste company which provides skips for construction, commercial and domestic waste. The Inagh Central Waste Management Facility is also located in Ballyduff Beg, Inagh, Co. Clare. Furthermore, Enva are located at Smithstown Industrial Estate in Shannon, Co. Clare and accept hazardous wastes. The vehicle movements required for removal of waste have been accounted for in the overall traffic number in section 15.3.1.

During the operational phase, minimal amounts of solid waste will be generated at the O&M Facility, which will be collected onsite and transported to a licensed disposal or recycling facility by a waste hauling contractor. Hazardous materials, such as gear and hydraulic oils used in the operation of the wind turbines and mineral oils used in transformers, will be disposed of in accordance with all applicable laws and regulations.

The types of wastes to be generated would be similar to established construction waste streams and would not require unusual or new treatment options. Waste volumes are not likely to be significant as to require new permitted treatment, storage and disposal facilities.

On decommissioning about 85 per cent of turbine components, including steel, copper wire, electronics and gearing, can be recycled or reused. The fibreglass blades however are difficult to recycle and currently are generally disposed of by landfill. For the Carrownagowan wind farm this would equate to approximately 912 tonnes of materials requiring disposal. This would be a moderate negative impact of the development and likely to require provision of new treatment technologies and/or facilities.

15.4 MITIGATION

15.4.1 Mitigation and Recommendations for Transport Infrastructure

The proposed development would generate an increase in the numbers of heavy vehicles using the local road infrastructure. The following measures are recommended to ensure a safe and regulated traffic management system is enforced:

- Pre-construction and post-construction surveys will be carried out to ensure the structural integrity of the proposed haulage route road network. Repairs will be carried out on the public

roads, as necessary, during the construction phase, to ensure that the condition does not deteriorate below a standard that could affect the use of the site, as required;

- Ensure a strict protocol for HGV drivers to follow the designated haulage route and timing restrictions, as detailed;
- Haulage traffic would share the same route with local residents, tourists, and other road users, which would present risks. Advance warning should be given to the local residents and other users (i.e. cyclists) for specific times when large volumes of HGV traffic may occur;
- All signage relating to the proposed construction traffic routes for construction traffic will be agreed with Clare County Council;
- A well planned and executed delivery programme avoiding peak traffic on typical days will be ensured (i.e. local school start and finish times);
- Adequate parking will be provided on site for both employees and visitors to ensure parking would not occur on the public road; and
- A road sweeping vehicle will be provided as required to remove any mud that is deposited on the local road in the vicinity of the site access.

15.4.2 Mitigation and Recommendations for Forest Resources

To date, Coillte has maintained and will continue to maintain its FSC Certification through safeguards and by implementing among others the Forest Service Guidelines to control erosion, minimise forest damage and protect water resources.

The impact of the wind farm on forest operations and the potential impact of forestry felling on the environment will be controlled as it currently is, by strict environmental controls, practices and guidelines as described by the relevant Forest Service Guidelines. Any tree felling required to facilitate the construction and operation of the wind farm will be kept to a minimum and under the terms of felling licences, Coillte will fulfil its obligations to replant clearfell areas.

The proposed project will not result in any significant adverse impacts on forest resources requiring additional mitigation.

15.4.3 Mitigation and Recommendations for Grid Capacity and Infrastructure

There is no anticipated effect upon the grid capacity and the electricity supply infrastructure as a result of the project. The project will provide a potentially positive effect of the electricity supply infrastructure. No specific mitigation measures are proposed.

15.4.4 Mitigation and Recommendations for Aviation

Whilst the proposed development will not impede aircraft flying the test trajectories, the navigational aids assessment recommends that it would be prudent to ensure that pilots of test aircraft are fully aware of the presence of wind turbines, and any associated anemometry masts, before undertaking any test flights. The following mitigation measures are therefore recommended:

- All turbines and meteorological masts having a height of 100m or more are promulgated in the Irish Air Navigation Obstacle database;
- The extremities of the wind farm are lit;
- Meteorological masts are lit;
- Meteorological masts are painted red and white to aid visibility to pilots;
- Locations of meteorological masts having a height of less than 100m are promulgated to the pilots of test aircraft;
- Test aircraft are fitted with Terrain Awareness and Warning System (TAWS);
- Test aircraft TAWS obstacle databases are regularly updated to ensure they contain the wind turbine and met mast locations prior to construction.

Having regard to the above:

- The developer shall agree an aeronautical obstacle warning light scheme for the wind farm development
- The developer shall provide as-constructed coordinates in WGS84 format together with ground and tip height elevations at each wind turbine location;
- The developer shall notify the IAA of intention to commence crane operations with a minimum of 30 days prior notification of turbine erection.

15.4.5 Mitigation and Recommendations for TV and Telecommunications

In the event of interference to television and telecommunication services arising from the wind farm development, Coillte are committed to work with telecommunication providers to remedy any issues of interference to affected communication links. Appropriate mitigation measures can be implemented such that there will either be an imperceptible effect, or no effect, on surrounding reception as a result of the proposed development, with the solution to interference with TV reception or communication links dependent on where the residence receives signal from.

As standard practice, a signed Protocol between the developer and RTE will be put in place, in which the developer will be responsible to resolve any issue of interference with television reception as a result of the proposed development.

15.4.6 Mitigation and Recommendations for Water and wastewater infrastructure

All wastewater to be taken off-site is to be undertaken by an authorised waste contractor and brought to an authorised waste facility.

15.4.7 Mitigation and Recommendations for Waste Management

- Waste is to be managed in accordance with the waste hierarchy in Council Directive 98/2008/EC on waste and section 21A of the Waste Management Act 1996, as amended, *as follows*:

(a)Prevention; (b)re-use; (c)Recycling; (d)Other recovery (including energy recovery); and (e) Disposal;

- All waste for offsite treatment/disposal is to be stored temporarily in appropriate dedicated storage areas. The areas in which wastes are stored on site are segregated to prevent material and contaminated surface water runoff entering local surface water drains.
- All chemical, hydrocarbon or other controlled wastes are to be stored in designated areas in appropriate approved containers within bunds or on spill pallets, as required.
- All waste to be removed from site is to be undertaken by authorised waste contractors and transported to an authorised facility in accordance with best practice.

15.5 RESIDUAL IMPACTS

15.5.1 Transport Infrastructure

The proposed construction and decommissioning works would have slight to moderate short-term negative effects.

15.5.2 Forest Resources

While the losses of the forest resource to the wind farm represent a minor economic loss in terms of wood production at a local level, the development proposal includes for replanting of the forest resource elsewhere. No significant negative residual impact to forest resources are anticipated as a result of the proposed wind farm development.

15.5.3 Grid Capacity and Electricity Infrastructure

No significant negative residual impact to grid capacity and electricity infrastructure are anticipated as a result of the proposed development.

15.5.4 Aviation

No significant negative residual impact to aviation is anticipated as a result of the proposed development.

15.5.5 TV and Telecommunications

In the event that interference is established and following the implementation of suitable mitigation measures; it is considered that there will be no significant residual impact on television services or telecommunication services as a result of the proposed wind farm development.

15.5.6 Water and wastewater infrastructure

No significant negative residual impact to water and wastewater infrastructure assets are anticipated as a result of the proposed development.

15.5.7 Waste Management

The disposal requirements for turbine blades is considered a moderate negative residual impact.

15.6 CONCLUSION

There is no evidence to suggest that the proposed Carrownagowan wind farm project will have significant negative effects on valued economic resources in the area.

The operational wind farm will not cause any material damage and does not pose any polluting or hazardous threat that would result in the devaluation or damage to valued material assets of the region.

Any unexpected impacts on TV and Telecommunication reception in areas can be suitably addressed under agreement between the applicant and any affected Telecommunication provider.

Any tree felling required to facilitate the construction and operation of the wind farm will be kept to a minimum and under the terms of felling licences, Coillte will fulfil its obligations to replant clearfelled areas.

During decommissioning approximately 85% of turbine components, including steel, copper wire, electronics and gearing, can be recycled or reused. Decommissioning will be a moderate negative impact of the development and likely to require provision of new treatment technologies and/or facilities.

The operation of the turbines will make a positive contribution to the supply of renewable energy. In terms of material assets, the proposal presents an opportunity for a positive effect in the use of renewables as it can contribute to a reduction in the use of fossil fuels. It will contribute to ensuring that adequate electricity supplies are available to support economic activity and growth.