FEHILY TIMONEY

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

VOLUME II – MAIN EIAR

Chapter 14 – Traffic and Transportation

Prepared for:

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CONTENTS

LIST OF FIGURES

LIST OF APPENDICES

LIST OF PLATES

LIST OF TABLES

14. TRAFFIC AND TRANSPORTATION

14.1 Introduction

This chapter of the EIAR assesses the likely significant effects of the proposed Derrynadarragh Wind Farm and substation, associated grid connection and turbine delivery route on the existing traffic conditions and transportation network, including changes to peak annual average daily traffic and the carrying capacity of the surrounding road network. The assessment examines potential effects on traffic and transportation for the construction, operation and decommissioning phases of the Project and identifies measures to mitigate impacts if required. Potential cumulative impacts with other developments are also assessed.

This Chapter of the EIAR is supported by Figures in Volume IV, Planning Drawings accompanying the planning application and the following Appendix documents provided in Volume III:

- Appendix 2.1: Construction Environmental Management Plan (CEMP)
- Appendix 2.1B: Grid Connection Construction Methodology (includes dedicated Grid Connection Route Traffic Management Plan)
- Appendix 2.3: Turbine Delivery Route Assessment
- Appendix 2.4: Turbine Delivery Route Nodes at 5 no. locations
- Appendix 11.3: Peat and Spoil Management Plan
- Appendix 12.2: Surface Water Management Plan
- Appendix 14.1: Traffic Management Plan

Refer to Appendix 2.1B: Grid Connection Construction Methodology, Volume III of the EIAR, for a dedicated Traffic Management Plan for the Grid Connection Route.

A full description of the Project assessed in this EIAR is provided in Chapter 2 Description of Proposed Development. The Proposed Development assessed in this EIAR comprises the following elements:

- The 'Proposed Wind Farm' (consisting of 9 no. turbines, turbine foundations and hard standing areas, new access tracks, onsite substation, underground electrical and communications cabling, drainage, temporary site compound and associated works);
- The 'Proposed Substation' (110 kV substation and loop-in connection to the existing overhead lines);
- Turbine delivery route (TDR).

14.1.1 Study Area

The proposed wind farm is located in the jurisdiction of Kildare County Council and Offaly County Council, with the turbine array located approximately 2 km south of Bracknagh, 5.24km north-west of Monastervin and 6.5km north-east of Portarlington. Please refer to section 2.3.2 of Chapter 2, Volume II of the EIAR, for the rationale around the proposed study area. The extent of the study area recommended within Wind Energy Development Guidelines (WEDG) (2006/2019) is 20km from the outer most turbines of the scheme. Impacts pertaining to other aspects of the Proposed Development such as the grid connection route, and turbine delivery route, are localised to the immediate environment, and as such the consideration of impacts focuses on the immediate landscape context within approximately 500m.

14.2 Assessment Methodology

14.2.1 Statement of Authority

The Traffic and Transportation chapter, Traffic Management Plan and site assessments were completed by Fehily Timoney and Company Engineers. The chapter was drafted by Aoife Hurd, checked by Leigh Doyle, and approved by Trevor Byrne. Please refer to Appendix 1.2 for full suite of CVs.

Trevor is an Associate Director at Fehily Timoney and a chartered member of Engineers Ireland with extensive experience in the preparation of traffic and transportation impact assessments for large scale renewable energy projects. Trevor holds a Master's degree in Sustainable Energy Systems from the University of Edinburgh and a first-class honours degree in Civil and Environmental Engineering following his studies at Edinburgh Napier University and Cork Institute of Technology.

Trevor has 15 years environmental engineering and environmental impact assessment experience and is a proven project manager with a track record in successfully guiding large scale projects through the consenting process as well as construction stage. He also has significant on-site experience relating to managing the construction of renewable energy developments and environmental coordination roles.

Trevor has over 15 years of environmental engineering and environmental impact assessment experience and is a proven project manager with a track record in successfully guiding large scale projects through the consenting process as well as construction stage. He also has significant on-site experience relating to managing the construction of renewable energy developments and environmental coordination roles.

Leigh Doyle is a Senior Project Engineer at Fehily Timoney and Company working in the Energy and Planning department. He has over 4 years' experience and holds a Master's degree in Civil, Structural and Environmental Engineering in UCC. Leigh is a member of the engineering team within the Planning and Energy division at FT and provides technical and engineering support to the EIAR teams for a variety of commercial scale renewable energy projects as well as other developments.

Leigh has experience in the preparation of Traffic and Transportation assessments, Air and Climate Assessments, as well as other technical chapters associated with EIAR's and environmental reports for renewable energy projects ranging from wind farms, solar farms, grid connections, battery energy storage systems and ancillary grid infrastructure projects. He also has experience in the design of renewable energy developments.

Leigh has site experience in the form of environmental walkover surveys and engineering surveys to inform Traffic and Transportation and Hydrology assessments for large scale energy projects. In addition, Leigh also has experience in carrying out fieldwork to support air quality monitoring campaigns and noise and vibration assessments in support of the Infrastructure and Noise teams at FT. Leigh also has experience relating to stakeholder and landowner liaison as part of his day-to-day project work and site work within the Planning and Energy Division.

Aoife Hurd is a Senior Civil Engineer at Fehily Timoney and Company working in the Energy and Planning Department. She holds a First-Class Honours Bachelor's Degree and Master's Degree in Civil, Structural and Environmental Engineering from Trinity College Dublin. She is a member of Engineers Ireland (EI) and has experience working on residential, infrastructure and renewable energy projects at all stages from concept to construction. Aoife provides technical and engineering support to the EIAR teams for a variety of commercial scale renewable energy projects.

Aoife has experience in the preparation of Traffic and Transportation assessments, Air and Climate assessments, as well as other technical chapters associated with EIARs and environmental reports for renewable energy projects ranging from wind farms, solar farms, grid connections, battery energy storage systems and ancillary grid infrastructure projects. She also has experience in the design of renewable energy developments.

The TDR route was identified and surveyed by Pell Frischmann Consulting Engineers. Pell Frischmann is a multi-disciplinary and international consultant engineering company working across infrastructure, buildings, and regeneration. The details of the proposed project are considered in relation to the construction, operation and decommissioning phases of the project.

The likely traffic that will be generated by each phase of the project is estimated to identify potential disruptions to existing road users within the study area. Based on the project construction methodologies described in Chapter 2 and the CEMP, an estimate of the number of vehicles generated as a result of the project is calculated. These estimates are used to assess the impact on the road network in numerical terms.

Site access points are assessed for suitability in the context of both Transport Infrastructure Ireland (TII) and Local Authority requirements for both geometric design and visibility. Potential disruption due to road or lane closures from works along public roads are also assessed.

The potential for soiling or damage to public road infrastructure through poor construction practices as well as potential health and safety hazards through poor traffic management are also identified where applicable.

The effects of the project on the existing transport network are then considered and described in terms of quality, duration and significance. Mitigation measures are then proposed followed by identification of residual impacts. The potential for cumulative impacts from other developments are assessed.

14.2.2 Construction Programming

As described in Chapter 2, the construction of the project in its entirety is expected to take 24 months. A 24-month construction programme was assumed for construction traffic generation movement calculations as part of this assessment.

The assessment uses a combination of field surveys, automatic traffic counter (ATC) data, desktop studies of potential haulage routes and local roads department consultation conducted by FT Engineers.

14.2.3 Relevant Guidance

The following guidance was adhered to during the assessment of traffic and transport in this EIAR:

- TII Publication PE-PDV-02045: Traffic and Transport Assessment Guidelines, TII, 2014;
- TII Project Appraisal Guidelines for National Roads Unit 5.3 - Travel Demand Projections, TII, 2021;
- EPA Guidelines on The Information to Be Contained In Environmental Impact Assessment Reports, EPA, 2022;
- Guidance on the preparation of the Environmental Impact Assessment Report, European Commission, 2017;
- TII Project Appraisal Guidelines for National Roads: Estimating AADT on National Roads, TII, 2016;
- TII Project Appraisal Guidelines for National Roads Unit 5.3 - Travel Demand Projections, TII, 2021;
- TII Geometric Design of Junctions (priority junctions, direct accesses, roundabouts, grade separated, and compact grade separated junctions) DN-GEO-03060, TII, April 2017;

- Road Traffic Act 2024;
- Guidelines for Managing Openings in Public Roads, Department of Transport, April 2017;
- Kildare County Development Plan 2023 - 2029;
- Offaly County Development Plan 2021 - 2027;
- Laois County Development Plan 2021-2027.

14.2.4 Sources of Information

- Traffic count data was obtained from 7-day traffic count surveys conducted on the 28th of April - 4th of May 2025;
- Open-source TII traffic counter information and private traffic count data carried out for historical impact assessments, accessed in April 2025;
- Ordinance survey and aerial mapping, accessed in April 2025;
- Project construction methodologies detailed in the CEMP;
- Site Layout Plans;
- Route Survey Report for the Turbine Delivery Route carried out by Pell Frischmann in December 2024.

The above sources of information have been used to identify the study area and transport routes to be assessed.

14.2.5 Consultation

For full details on the EIAR consultation, please refer to Chapter 5 - EIA Scoping & Consultation, Volume II of the EIAR.

Transport Infrastructure Ireland (TII) were consulted as part of the EIAR scoping process. No response was received.

Offaly County Council (OCC) Roads Department were consulted during the EIAR scoping phase and through a virtual meeting on the 19th of June 2025. The purpose of the consultation meetings was to present proposed delivery and haul routes, the turbine delivery route, the grid connection route, road upgrades, and construction entrances to the Area Engineer for comment and feedback. Any recommendations received by the roads department would then be implemented to the design and application in advance of the submission to the local authority.

Laois County Council (LCC) Roads Department were consulted during the EIAR scoping phase and through a virtual meeting on the 23rd of May 2025. The purpose of the consultation meetings was to present the proposed grid connection route, haul routes, turbine delivery route, and general project information to the Area Engineer for comment and feedback. Any recommendations received by the roads department would then be implemented to the design and application in advance of the submission to the local authority.

Kildare County Council (KCC) - Several attempts were made to contact KCC Pre-Planning team to arrange a date for a meeting to discuss the road, TDR and GCR elements, however, no response was received. Due to the location of the main site access falling within Offaly County Council area, and the Grid Connection Route covering Laois County Council, it was considered that this meeting was less critical to the development of these elements of the scheme. It is important to flag that KCC did not provide any comment through the EIAR Scoping Process. However, the comments received during the initial pre-application meeting which took place in September 2023 highlighted the need for swept path analysis and consideration of an alternative Grid Connection Route which have been undertaken and assessed through the relevant Chapter 3 – Site Selection and Alternatives, Volume II, and Appendices 2.3 and 2.4, Volume III of the EIAR.

An Garda Síochána were also consulted during the EIAR scoping phase. No response was received.

14.3 Existing Environment

14.3.1 Existing Road Network

Roads in the Republic of Ireland are classified as motorways, national (primary and secondary), regional and local roads. Transport Infrastructure Ireland (TII) has overall responsibility for the planning and supervision of the construction and maintenance of motorways, national primary and secondary roads. The local authorities have responsibility for all non-national roads. The hierarchy of roads throughout Ireland is outlined in Table 14-1.

Table 14-1: Road Categories

Road Category	Description
Motorways	These are high quality multiple lane roads with limited grade separated junctions. They are high speed (120kmph) roads predominantly provided to facilitate strategic traffic with reduced journey times.
National Primary Roads	These are predominantly single carriageways, with some that are dual carriageways. Generally high speed (100kmph) roads that facilitate strategic traffic, with reduced journey times.
National Secondary Roads	These are medium distance through-routes connecting towns, serving medium to large geographical areas and linking to primary routes to form a homogeneous arterial network.
Regional Roads	Predominantly single carriageway roads of regional and local importance. These roads generally receive more frequent maintenance criteria than Local Roads and therefore tend to be structurally sound.
Local Roads (Primary, Secondary and Tertiary)	The local road system is operated in three tiers defining local importance, usage and maintenance priorities. They form a network of single carriageway roads of varying quality.

Motorways

The nearest motorway to the site is the **M7** which is a primary east-west motorway connecting Dublin to Limerick. The M7 is located approximately 6.80 km to the southeast (straight line distance) of the Site. The AADT for the M7 in 2024 according to the TII automatic traffic counter (TMU M07 045.0 E) data was 33,382 with approximately 8.5% of this comprised of HGV traffic. For all traffic count positions considered in the assessment, full yearly data available for 2022, 2023, and 2024 was applied.

The **M6,** approximately 25km northwest (straight line distance) of the site, is utilised for the Turbine Delivery Route (TDR) which departs at Junction 5 of the M6 motorway network. In addition, one of the haul routes is located on approximately 16km of the M6 before turning south towards the site on the N52. The AADT for the M6 in 2024 according to the TII automatic traffic counter (TMU M06 025.0 W) data was 23,282 with approximately 8.2% of this comprised of HGV traffic.

There are no other motorways located within 20km of the Site. Please refer to section 2.3.2 of Chapter 2, Volume II of the EIAR, for the rationale around the proposed study area. The extent of the study area recommended within Wind Energy Development Guidelines (WEDG) (2006/2019) is 20km from the outer most turbines of the scheme.

The Grid Connection Route (GCR) does not utilise the motorway network.

National Primary Routes

The nearest national primary road is the **N7**, which is located approximately 31km to the east (straight line distance) of the site. The N7 forms part of the route from Dublin to Limerick where it merges into the M7 near Naas. The AADT for the N7 in 2024 according to TII automatic traffic counter (TMU N07 023.0 E) data was 90,823 with approximately 7.8% comprised of HGV traffic.

The GCR or TDR do not utilise the national primary road network.

National Secondary Routes

The closest national secondary road to the site is the **N80**, located approximately 16.45km to the west of the Site (straight line distance). The N80 connects Portlaoise to Tullow in Co. Carlow. The AADT for the N80 in 2024 according to the TII automatic traffic counter (TMU N80 000.0 N) data was 10,948 with approximately 5.7% of this comprised of HGV traffic.

The **N52,** located at the northern end of N80 at Tullow, forms part of the TDR and haul routes. The AADT for the N52 in 2024 according to the TII automatic traffic counter (TMU N52 115.0 E) data was 15,252 with approximately 6.7% of this comprised of HGV traffic.

The GCR does not utilise the national secondary road network.

Regional Roads

The nearest regional road is the **R419** where the main site entrance is located. The R419 runs from the town of Portarlington in County Laois, heading northeast to Rathangan in County Kildare. The AADT for the R419 in 2025 according to the procured Automatic Traffic Count data was 2,669 with approximately 7.37% comprised of HGV traffic. The R419 is a single carriageway and has centreline and edge markings in places. The road surface is in generally good condition with minor rutting and localised depressions. There are sections where repairs for rutting and upheaval of the road are evident. The R419 forms approximately 1.10 km of the TDR and haulage routes.

The TDR utilises a large section of the **R400** regional road which connects Mullingar in County Westmeath to Cushina in County Offaly, crossing the M6 motorway. The AADT for the R400 in 2025 according to the procured Automatic Traffic Count data was 782 with approximately 3.71% comprised of HGV traffic. The R400 is a single carriageway and does not have centreline and edge markings in for major sections of the TDR and haul routes. The R400 forms approximately 14.8 km of the TDR, 3.9km of haul route 1 and 25.6km of haul route 2.

The GCR travels along short sections of the **R424** and **R420** regional roads where the R424 (approx. 1.62 km of the GCR) merges into the R420 (approx. 1.86km of the GCR) before turning into the Bracklone 110kV substation. The AADT for the R424 in 2025 according to the procured Automatic Traffic Count data was 2,436 with approximately 0.92% comprised of HGV traffic.

Local Roads

There are several local roads in the vicinity of the Site. The TDR does not utilise the local road network.

The GCR proposes the use of the L70481, L71764, L7050, L7051 and L7176, L71761 local roads.

The AADT for the L7176 in 2025 according to the procured Automatic Traffic Count data was 240 with approximately 3.81% comprised of HGV traffic.

14.3.2 Other Transport Network Infrastructure Within the Study Area

The site is situated approximately 5.7 km from the Dublin - Cork InterCity railway line with several stations located nearby including Monasterevin, Portarlington, and Kildare station.

The Monasterevin station in County Kildare is located approximately 5.8 km to the southeast (straight line distance) from the site and serves as a key stop on the Dublin - Cork InterCity line.

The Portarlington station in County Laois, located approximately 6.9 km to the southwest (straight line distance) from the site, operates as a key interchange between the Dublin - Cork InterCity line and the routes to Galway, Ballina, and Westport.

The Kildare station in County Kildare, approximately 13.7 km to the southeast (straight line distance) from the site, serves the Dublin–Cork InterCity railway line and acts as a major interchange for passengers traveling between Dublin and the south and west of Ireland.

The Barrow River located approximately 4.5km south-east of the site, forms part of the Barrow Navigation, a navigable waterway managed by Waterways Ireland.

The Grand Canal Way greenway is located 14.5km to the north-west of the site (straight line distance), in Daingean, Co. Offaly. This greenway traverses Leinster from Ringsend in Dublin City to the River Shannon at Shannon Harbour in County Offaly.

There are no other active railway lines, greenways or waterways within 20km of the Proposed Development. Please refer to section 2.3.2 of Chapter 2, Volume II of the EIAR, for the rationale around the proposed study area. The extent of the study area recommended within Wind Energy Development Guidelines (WEDG) (2006/2019) is 20km from the outer most turbines of the scheme.

14.3.3 Existing Environment Traffic Volumes

Existing traffic volumes on roads in the study area are shown in Table 14-2 below. TMU data was sourced from TII Traffic Data[1] for 2024. Data for the R419, R400, R414, R424, and the L7176 was obtained from 7-day traffic count surveys conducted on the 28th of April - 4th of May 2025. This was obtained in line with best practice guidance as TII Traffic Data was not available on regional or local roads in the vicinity of the Site.

[1] Traffic Counts for Transport Infrastructure Ireland

Table 14-2: Baseline Traffic Volumes

Road	Baseline AADT		
	HGV	LGV	AADT
M7 (TMU M07 045.0 E)	2,837	30,545	33,382
M6 (TMU M06 025.0 W)	1,909	21,373	23,282
N7 (TMU N07 023.0 E)	7,084	83,739	90,823
N80 (TMU N80 000.0 N)	624	10,324	10,948
N52 (TMU N52 115.0 E)	1,022	14,230	15,252
R419 at Cushina (Google Maps Ref: 53.198415, -7.152986)	197	2,473	2,669
R400 at Walsh Island (Google Maps Ref: 53.248315, -7.200276)	29	753	782
R414 at Mountrice (Google Maps Ref: 53.178501, -7.022231)	61	2,374	2,435
R424 at Lea, Ballyhast (Google Maps Ref: 53.149259, -7.122296)	22	2,414	2,436
L7176 at Ullard (Google Maps Ref: 53.153338, -7.106488)	9	231	240

AADT figures were projected to a proposed construction commencement year of 2027 from 2024 and 2025 source data in accordance with NRA Project Appraisal Guidelines for National Roads: Unit 5.5 Link-Based Traffic Growth Forecasting, 2011 and TII Project Appraisal Guidelines for National Roads: Unit 5.3 – Travel Demand Projections, 2021. Projected traffic volumes for the commencement year 2027 on roads in the study area are shown in Table 14-3 below.

Table 14-3: Projected Baseline AADT for 2027

Road	Projected Baseline AADT for 2027		
	HGV	LGV	AADT
M7 (TMU M07 045.0 E)	3,171	32,386	35,557
M6 (TMU M06 025.0 W)	2,134	22,661	24,795
N7 (TMU N07 023.0 E)	7,918	88,786	96,704
N80 (TMU N80 000.0 N)	697	10,946	11,644
N52 (TMU N52 115.0 E)	1,142	15,088	16,230
R419 at Cushina (Google Maps Ref: 53.198415, -7.152986)	212	2,571	2,783
R400 at Walsh Island (Google Maps Ref: 53.248315, -7.200276)	31	783	814
R414 at Mountrice (Google Maps Ref: 53.178501, -7.022231)	66	2,468	2,534
R424 at Lea, Ballyhast (Google Maps Ref: 53.149259, -7.122296)	24	2,510	2,534
L7176 at Ullard (Google Maps Ref: 53.153338, -7.106488)	10	240	250

14.4 Proposed Project

A large infrastructural project of this nature will generate additional traffic on the existing road network because of the construction, operation and decommissioning stages. A detailed description of the project assessed in this EIAR is provided in Chapter 2 - Description of Proposed Development.

The following sections describe the Project in the context of the existing traffic conditions and transportation network.

14.4.1 Construction Programme

The construction of the project in its entirety is expected to take 24 months; therefore, a 24-month construction programme was assumed for the purposes of assessing conservative traffic volumes in the traffic impact assessment.

Some items will be conducted in parallel, but the basis of the construction programme will involve site establishment, site access road and drainage construction, hardstanding construction and substation works. The grid connection works are likely to be done in parallel with the site works and the turbine installation works will be completed before commissioning, reinstatement and landscaping. However, it is also possible that the grid route could commence prior to the on-site infrastructure or after the construction of the on-site infrastructure. Carrying out the grid connection works in parallel with the site works represents the worst-case scenario as it would generate peak volumes of construction traffic on the local road network.

An indicative construction programme is presented in Chapter 2 - Description of Proposed Development.

14.4.2 Main Site

As described in Chapter 2, the Site includes the wind turbines, internal access tracks, hard standings, lightning protection and telecommunications masts, onsite substation compound, internal electrical and communications cabling, temporary construction compounds including a wheel wash facility, lay down areas, drainage infrastructure and all associated works related to the construction of the wind farm.

14.4.3 Site Access

The Proposed Wind Farm will include a new site entrance along the R419 Regional Road to serve as construction and operation access to the proposed wind farm and onsite 110kV substation, an additional access from L-70481 will be used for construction on the south of the river Cushina, prior to completion of the bridge crossing.

The access point has been selected with consideration for the safety of public road users, construction staff and to ensure they can be constructed to comply with the requirements of Kildare County Council, Offaly County Council and TII design requirements for direct access. The location of the access point is shown on the haul route Figure 14.2 in Volume IV of this EIAR.

The R419 entrance will be constructed to facilitate the delivery of turbine components. All turbine components accessing the site will use this entrance. The general regional road speed limit of 80kph applies. The minimum sight distance for an 80kph road is 160m in line with Transport Infrastructure Ireland (TII) standards (TII Publication DN-GEO-03060).

An assessment of the existing geometry and sightlines from this entrance was carried out in August 2023 with existing roadside visibility in both directions at the access point presented in Table 14-4.

There is good visibility from this access point with a sightline of 160m that can be achieved at 'X' = 0m in both directions. With hedgerow trimming a sightline of 160m is likely to be achievable at 'X' = 3m in both directions. Hedgerow and treeline maintenance may be required periodically in both directions from the public road to ensure the desired sightlines are maintained, such works will be carried outside the bird breeding season.

Table 14-4: Sightlines at Proposed Access Location

Coordintates WGS84	Y (m) at x=0m[2]		Y (m) at x=3m[3]	
	To right	To Left	To right	To Left
53.198917, -7.151611	160	160	NA[4]	NA[3]

[2] The distance back along the minor road or direct access from which the full visibility is measured is known as the 'x' distance. It is measured back along the centreline of the minor road or direct access from the continuation of the line of the nearside edge of the paved surface (including hard strip or hard shoulder) of the major road. (TII Standard DN-GEO-03060: Geometric Design of Junctions, May 2023).
[3] From the point "x" metres back from the major road a driver approaching the junction along the minor road will be able to see clearly points to the left and right on the nearer edge of the major road running carriageway at a distance measured from its intersection with the centreline of the minor road. This is called the 'y' distance. (TII Standard DN-GEO-03060: Geometric Design of Junctions, May 2023).
[4] A 3-metre setback from the road edge was not available at the proposed new entrance location due to the existing hedgerow and vegetation.

Plate 14-1: Proposed Site Entrance Location

Plate 14-2: Existing Visibility to Left from Proposed Site Entrance at X=0m

Plate 14-3: Existing Visibility to Right from Proposed Site Entrance at X=0m

A sightline assessment of the existing access to the south of the site is not required, as the southern access road is a cul-de-sac with sufficient forward visibility for development traffic during the construction stage.

14.4.3.1 Felling

Permanent felling of 6.5 ha of forestry will be carried out at the main entrance to the wind farm and along the internal access tracks where necessary to accommodate the delivery and construction of turbines, hardstands, crane pads, temporary compounds, along the proposed GCR from the site to the substation and to provide for mitigation for Bat, as detailed in Chapter 9 - Biodiversity. The removal of woody vegetation hedgerows and forestry will be undertaken in full compliance with Section 40 of the Wildlife Act 1976 – 2022 and will commence outside the bird nesting season 1st of March to 31st of August inclusive.

14.4.3.2 Construction Haul Routes

In constructing the wind farm, materials and plant will be delivered to the site. The material haul routes will include some of the surrounding road network which will need to cater for the additional traffic associated with the project. Indicative haul routes for the Proposed Development are shown in Figure 14.2, Volume IV of this EIAR.

The traffic impact assessment assumes all structural fill for access tracks, turbine hardstands, turbine foundations and on-site substation will be sourced from local quarries and transported to the site along the road network. This assumes all series 600 material for bases and Clause 804 material for surface courses of roads, foundations, hardstands etc. will be transported from externally licensed quarries.

The surrounding quarries currently in operation and indicative haul routes to the site have been identified. The nearest suppliers of quarry stone (TII Class 6 products) and concrete are:

1. Kilmurray Sand and Gravel Quarry, Derryarkin, Co. Offaly, located c. 29.4km (N) from the proposed development site, supplying crushed aggregates and concrete products.
2. Roadstone Quarry, Ballykilmurry, Tullamore, Co. Offaly, located c. 32.7km (NW) from the proposed development site, supplying crushed aggregates and concrete products.

Two other quarries near Allen, Co. Kildare (Roadstone Allen and Arkil) are also in the vicinity of the site. However, these are not preferred due to their routes through Rathangan, Co. Kildare and Bracknagh, Co. Offaly.

Construction deliveries from Kilmurray Sand and Gravel Quarry will use the R400, M6, N52, R420, and the R419 as the designated delivery route to the main site entrance. Construction deliveries from Roadstone Quarry Tullamore will use the R443, N52, R420 and R419 as the designated delivery route to the main site entrance.

During the construction phase, standard HGVs will use the existing southern access, located within Co. Kildare, if transporting materials prior to on-site bridge being constructed using the L70481, L71764, L7050, L7051, L7176, and L71761 local roads. Construction access to the grid connection infrastructure will also be via the existing southern site access using the L70481, L71764, L7050, L7051, L7176, and L71761 local roads. Otherwise, all construction traffic will use the main northern access, located in Co. Offaly.

Traffic associated with the construction phase include:

- HGVs carrying aggregates, pipes and other materials associated with construction of the internal access tracks, hard standings and drainage infrastructure;
- HGVs (concrete wagons) carrying concrete for turbine foundations and substation foundations;
- HGVs carrying building materials for the substations as well as electrical equipment and cabling;
- HGVs carrying plant and fuel;

- HGVs exporting site waste;
- Cranes and associated elements for the main crane for erecting the turbines;
- Private cars and vans for the commuting workforce.

Waste Management Facilities

Authorised waste management facilities have been identified in the greater County Kildare and County Laois area as listed on the Local Authority Waste Facility Register by the National Waste Collection Permit Office. The authorised waste facilities utilised during the construction and decommissioning of the proposed project will depend on the contractors appointed and will depend on the capacity of the various facilities at the time of construction and decommissioning. A list of existing licensed waste facilities in proximity to the wind farm site is presented in Table 14-5 below. These facilities were identified at the time of the preparation of this EIAR.

Table 14-5: Licensed Waste Facilities in the Vicinity of Derrynadarragh Wind Farm

Licensed Waste Facility Location	Type of Waste
J. Ryan Haulage Ltd. Cushina, Portarlington, Co. Offaly (c. 3.4km from site)	Soil and stones
Pat Mangan, Ballycon Mount Lucas Daingean Co. Offaly (c. 16.4km from site)	Soil and stones
Killeshal Precast Concrete Ltd, Killeshal, Daingean, Co. Offaly R35 YK85 (c. 24km from site)	Concrete, soil and stones, mixed construction and demolition waste
T/A Oxigen Environmental Barnan, Daingean Co. Offaly R35 EE64 (c. 26km from site)	Waste plastics (except packaging), waste from forestry, waste metal, paper and cardboard packaging, plastic packaging, wooden packaging, metallic packaging, composite packaging, mixed packaging, glass packaging, textile packaging, concrete, bricks, tiles and ceramics, mixture of concrete, bricks, tiles and ceramics, wood, glass, plastic, copper, bronze, brass, aluminum, lead, zinc, iron and steel, tin, mixed metals, cables, soil and stones, insulation materials, gypsum-based construction materials, mixed construction and demolition wastes, paper and cardboard, ferrous metal, non-ferrous metal, plastic and rubber, glass, wood containing dangerous substances, wood, textiles, minerals (for example sand, stones), combustible waste (refuse derived fuel)
Anthony Cocoman, Shean Edenderry Co. Offaly (c. 17km from site)	Concrete, soil and stones

Licensed Waste Facility Location	Type of Waste
Hinch Plant Hire Ltd, Ballydownan Geashill Co. Offaly (c. 15.6km from site)	Soil and stones
John Mallen, Ballycon Mount Lucas Co. Offaly, (c. 15.1km from site)	Concrete, soil and stones, dredging spoil

14.4.4 Electrical Infrastructure / Grid Connection

This section summarises the information regarding the grid connection. For a more detailed description please see Section 2.4.5 of Chapter 2 - Description of Proposed Development.

14.4.4.1 Internal Network Cable

Electricity generated from wind turbines will be collected at high voltage (33kV) by an internal circuit of buried cables. This circuit will be terminated at the proposed onsite substation. The internal collector circuit cable routes are shown on the planning application drawings and will follow the alignment of the internal access tracks. A short section, c. 212m, of the cable alignment is along the L10057 road. Otherwise, the remaining sections of the internal collector circuit cable are off road within agricultural land or forestry.

The electricity will be transmitted as a three-phase power supply so there will be three individual conductors (or individual cables) in each cable circuit. The three conductors will each be laid in separate ducts which will usually be laid in a trefoil formation but may also be laid in a flat formation where conditions require it, such as where the ducts need to cross an existing structure or culvert. In such cases, cable ducts will be cast into the structures to allow the power cables to cross the watercourses under the access tracks.

With a trefoil formation, the internal cable trench width will be 600 mm, and with a flat formation, the trench width will be 1200 mm. The depth of cover to the ducts carrying the cables will be 900 mm to the top of the upper ducts. The depth of trench for the cables will be 1200 mm. The diameter of the ducting will be selected to suit the range of cross-sectional areas of electrical cables and is likely to fall between 100 mm and 200 mm diameter.

Internal cable trench section types associated with on-site electrical cabling are presented in the accompanying planning application drawing P22-145-0500-0004.

As part of the scoping and consultation process for the Proposed Development, searches of existing utility services were carried out to identify whether there were any other where major assets exist such as high voltage electricity cables or utility and telecommunications services. There are no known services within the Site. However, in advance of the construction phase cable detection tools, ground penetrating radar and slit trenches will be used, as appropriate, to verify existing services and their exact location. It is expected that partial road closures and stop/go system will be put in place to facilitate this work. This will enable the works to be completed as quickly and as safely as possible, with minimal disruption time for residents of the area.

14.4.4.2 On-Site Electrical Substation and Grid Connection Route

The Proposed Grid Connection identified to supply power from the Proposed Development to the Irish National Electricity Grid will exit the site to the south and follow the public road to Bracklone Substation.

It is proposed to construct a 110kV electricity substation within the Site. Access to the substation will be from the R419 through internal wind farm site access tracks. Upon decommissioning of the Proposed Wind Farm, the 110kV substation within Cushina townland will remain part of the national grid infrastructure.

The footprint of the proposed on-site (TSO) 110kV substation compound measures approximately 5,250m^2 in area and will include 1 no. control building (18m x 25m and 7.4m high), the electrical substation components necessary to consolidate the electrical energy generated by each wind turbine and the components necessary to export that electricity from the on-site 110kV substation to the national grid.

Due the nature of the Proposed Development and the low frequency use, drinking water will be provided via bottled supply if needed. Wastewater from the welfare facilities will not be treated on-site. Instead, it will be collected in a sealed underground storage tank and removed periodically by a licensed waste collector to an approved wastewater treatment facility. Only waste collectors with valid permits under the Waste Management (Collection Permit) Regulations, 2007 (as amended) will be authorised to transport wastewater from the site.

The overall length of the grid connection between the on-site substation and the Bracklone Substation is 11.4km, which will run through 9.1km of existing public road, 0.3km in existing tracks and 2km in new access tracks on the wind farm site. It will also require a crossing of the L-10057 road within the Site.

As part of the scoping and consultation process for the Proposed Development, searches of existing utility services were carried out to identify areas where major assets exist such as high voltage electricity cables or gas mains. Private utility and telecommunications companies were also consulted. There are no known services within the L-10057 road. However, in advance of the construction phase cable detection tools, ground penetrating radar and slit trenches will be used, as appropriate, to verify existing services and their exact location.

It is expected that full road closures will be put in place to facilitate cabling works in combination with lane closures, partial road closures and stop/go systems. This will enable the works to be completed as quickly and as safely as possible, with minimal disruption time for residents of the area. The cabling works will require delivery of plant and construction materials to the sections along the route, followed by excavation, laying of cables and subsequent reinstatement of trenches and road surfaces. Road closures will be applied for by the appointed contractor and will outline local diversions whilst always maintaining local access for residents, farms and businesses.

Please refer to Section 6.9 of Appendix 2.1B - Grid Connection Construction Methodology for the proposed traffic management plan for the proposed GCR.

The ducts will be installed, and the trench reinstated in accordance with landowners, EirGrid, and Kildare County Council, Laois County Council and Offaly County Council specifications. The electrical cabling/fibre cable will be pulled through the installed ducts. Construction methodologies implemented and materials used will ensure that the GCR is installed in accordance with the requirements and specifications of EirGrid.

The appointed contractor will at all times implement suitable traffic management in the form of a stop-go system. Enforcement of traffic management procedures will include temporary traffic lights/ flag men in place during proposed ducting works. Should the need for weekend or night works be required this will be adhered to by the build contractor and agreed with in writing prior to such works taking place. Road closures will be subject to the applicable statutory licensing processes as implemented by the roads authority. Road closures will be facilitated by the existing network of roads in the area.

The grid connection route is identified in Figure 2.3, Volume IV of the EIAR.

14.4.4.3 Trench Details

The proposed trench and ducting will be installed at a minimum depth of 1500mm so as not to conflict with the drainage for the public roadway. No existing safety barriers reside along the route in which the ducting is proposed. The ducting will be installed in line with EirGrid / ESBN specification and design reviewed with all relevant stakeholders prior to obtaining a road opening license. Any improvements required to facilitate development will be identified prior to works. The ducting will be placed and designed in such a position to ensure that future routine network improvements such as pavement overlay and strengthening, installation of new verge-side signs and other road furniture are not impacted by the cable trench.

All materials used in the reinstatement of trenches will comply with the requirements of the Department of Transport guidelines for the Opening, Backfilling and Reinstatement of Trenches in Public Roads and the TII Specifications for Road Works.

It is proposed that all roads will be reinstated expeditiously on completion of the construction works. Roads will be reinstated to their pre-works condition or better and to the satisfaction of the roads authority.

Details for trench excavation, backfilling and road surface reinstatement methodologies are contained in the CEMP - Appendix 2.1, Grid Connection Construction Methodology - Appendix 2.1B and in Chapter 2 and will be designed and constructed in accordance with EirGrid specifications[5].

14.4.4.4 Joint Bays

There are 15 no. Joint bays along the grid connection route. Joint bays will be to EirGrid standard specifications (6m x 2.5m) and will consist of 3 pre-cast concrete chambers with ducting. Once the cables have been jointed and commissioned, the entry and exit points and joint bay chamber will be filled with sand and a concrete cover fitted on top.

A manhole type cover will be fitted over the start and end points of the grid connection cable route and over the link bay chambers. Over-ground identification marker posts and marker plates will be installed along the grid connection route. The manhole covers and marker plates/posts will be the only surface expression of the underground cabling when works are completed. Refer to Planning Drawings P22-145-0103-001 to P22-145-0103-007 for joint bay locations. All joint bays will be located outside of the Flood zone as per [CFRAM 1:1000 flood model].

[5] https://www.eirgridgroup.com/customer-and-industry/general-customer-information/transmission-policies-and/

14.4.4.5 Crossings

There will be 7 no. crossing points comprising 6 no. watercourse crossings and 1 no. dry stone arch bridge crossing at disused canal. There will be 6 no. Horizontal Directional Drilling (HDD) and one crossing and one flat formation crossing within the road above an existing culvert. HDD involves construction of a launch and retrieval pit either side of a crossing and cable conduits are then drilled from the launch pit to the retrieval pit. All pits will be outside of Flood zone as per CFRAM 1:1000 flood model and will maintain a buffer of 50 m outside of the River Barrow SAC.

A competent specialist HDD contractor will be appointed for the proposed works. The HDD Contractor will conduct the drilling works in a safe and controlled manner with due regard for site constraints including environmental issues. The Contractor will be required to ensure that their proposed works do not adversely affect, existing services / utilities, groundwater / aquifers.

See Chapter 2 for further details and Planning Drawing 0103 Series and Drawing Refs: DANU-DAR-D001.1; DANU-DAR-D001.2; DANU-DAR-D001.3; DANU-DAR-D001.4; DANU-DAR-D001.5; DANU-DAR-D001.6 for HDD crossing details. Furthermore, detailed construction methodologies are contained in the CEMP in Appendix 2.1 and Grid Connection Construction Methodology in Appendix 2.1B, Volume III.

14.4.5 Turbine Delivery Route

The proposed turbine delivery route (TDR) is presented in Figure 2.4, Volume IV of the EIAR.

Pell Frischmann (PF) were commissioned by Fehily Timoney (FT) to undertake a study of the delivery route for wind turbine Abnormal Indivisible Loads (AIL) associated with the construction and development of Derrynadarragh Wind Farm. The Route Survey Report (RSR) has been prepared to help inform the EIAR on the issues associated with the development of the site regarding off-site transport and access for AIL traffic and includes a detailed swept path analysis (SPA). The report identifies the key issues associated with AIL deliveries and identifies remedial works, either in the form of physical works or as traffic management interventions that will be required to accommodate the predicted loads. A copy of this report is contained in Appendix 2.3, Volume III. The use of worst-case sized turbine components was assessed. Their details are contained in Appendix 2.3.

Turbine blades will be carried on a Superwing Carrier trailer to reduce the need for mitigation in constrained sections of the route. The base and mid towers would be carried on a 4+7 clamp trailer. The hub, nacelle housing, and top towers would be carried on a six-axle step frame trailer.

An updated swept path assessment on 5 no. TDR nodes was carried out by Dara Energy Limited to take account of topographical surveys and change of approach following engagement with landowners. Please refer to Appendix 2.4, EIAR Volume III, for the Dara Energy Ltd. Turbine Delivery Route Assessment Report.

There are several ports that have proven capability to accept and store large wind turbine components. These ports include Waterford, Cork, Foynes, Galway and Dublin. Transportation of wind turbine components from these ports to the national motorway network has been demonstrated. The facilities within the ports and access to and from the ports is continually being upgraded as part of general improvements and as anticipated in the due to be released National Ports Policy. It is on this basis that it is not foreseen that this project will require any material change to the port or to the access to the national motorway network should the project be consented and enter the construction phase.

A substation transformer unit will be transported to the site which will be categorised as an abnormal load. As a result, an abnormal load permit will be sought for this movement. This load shall follow the same route to the site as the TDR.

For the purpose of this EIAR, the following transport route has been selected and assessed to facilitate turbine delivery to the Site:

- The Turbine components will be delivered to the Galway Port and travel to the M6.
- At Junction 5, depart the M6 and continue south on the N52.
- Depart the N52 to the east of Tullamore and turn left onto the R420, eastbound.
- Turn left onto the R402 northbound.
- Continue north and then east on the R402 through Ballinager and Daingean.
- Turn right from the R402 onto the R400 travelling south.
- Remain on the R400 until reaching R419.
- Turn left from to join the R419 then proceed northeast towards the site entrance.

The objective will be to always maintain the strategic capacity and safety of the N52 carriageway, cognisant of the National Development Plan, 2021 – 2030, with key sectoral priorities for maintaining the national road network to a robust and safe standard for users.

Accommodation works will be required at selected locations along the TDR to facilitate the delivery of large components to the site. This will include some temporary hardcore surfacing at roundabouts or areas of over sail, and overhead utilities and obstructions will need to be removed at several locations to provide adequate overhead clearance. The removal of overhead utilities will be by either temporary disconnections or permanent re-routing. Such works will be carried out by the utility providers in advance of turbine delivery to site. Most of the temporary accommodation works associated with the TDR will be fully reinstated following the construction stage, except for the permanent Bridge Crossing at Philipstown Bridge (see Node 29/30 within Table 14-6).

Accommodation works required along the proposed Turbine Delivery Route (TDR), which will form part of the planning application red line boundary, to facilitate the delivery of turbine components are to be located at the following 7 no. locations (extent of works summarised in Table 14-6):

- TDR Node No. 19 at R420 / R402 Junction
- TDR Node No. 22 at R402 St Joseph's National School
- TDR Node No. 29/30 at R402 / R400 Junction & River Philipstown Bridge
- TDR Node No. 32 at R400 East of Mountlucas
- TDR Node No. 35/36 at R400 South of Enaghan
- TDR Node No. 38 at R400 East of Moanvane
- TDR Node No. 46/47 at R400 / R419 Junction

Certain temporary accommodation works associated with the TDR and the provision of passing opportunities along the local road network are subject to this EIA but for which planning consent is not being sought within the current application. These works to facilitate the delivery of turbine components and haulage to the Site are detailed further in Table 14-6 and include hedge or tree trimming, temporary relocation of powerlines/poles, lampposts, signage and temporary local road widening. For these locations, works have been identified and assessed in the EIAR, however, these works will be carried out under a Road Opening Licence to be sought from Offaly County Council.

Temporary accommodation works will only be required during the operational phase in the unlikely event of a major turbine component replacement. The temporary accommodation works will not be required for the decommissioning phase as turbine components can be broken up on site and removed using standard HGVs.

Key elements of the complete accommodation works required for the delivery of turbines are summarised in Table 14-6.

Table 14-6: TDR Accommodation Works

TDR Node Reference	Location	Details	Summary Description of Proposed Temporary Accommodation Works
13	M6 Slip Road / N52 Roundabout	Loads will take the third exit at the roundabout to join the N52 southbound, undertaking a contraflow manoeuvre.	Installation of Load Bearing Surface on southern verge of entry arm and the central reservation.
19	R420 / R402 Junction	Loads will turn left using the option area identified by the client.	Installation of Load Bearing Surface on the inside of the left turn.
22	R402 St Joseph's National School	Loads will turn right at the junction to head east, remaining on the R402	Installation of Load Bearing Surface on the western footway/verge, the northern footway/verge and the traffic island.
25	Daingean Main Street / Edenderry Road	Loads will continue through Daingean on the R402	Installation of Load Bearing Surface in the northern footway.
29/30	R402 / R400 Junction & River Philipstown Bridge	Loads will turn right prior to the junction, through the field and rejoin the R400.	Construction of new access bridge bypassing R402/R400 Junction.
31	R400 North of Drumcaw Or Mountlucas	Loads will head south-east on the R400 through a left bend.	Installation of Load Bearing Surface on the southern verge.
32	R400 East of Mountlucas	Loads will continue on the R400 southbound.	Installation of Load Bearing Surface on the western verge.
33	R400 South-east of Mountlucas	Loads will continue on the R400 southbound.	Installation of Load Bearing Surface on the eastern verges.
34	R400 Northeast of Brackagh	Loads will continue on the R400 southbound.	Trimming of vegetation and trees on both verges.
35/36	R400 South of Enaghan	Loads will drive over a bridge, then continue straight at the junction through the field and rejoin the R400 following the right bend.	Construction of new offline track to bypass bend onR400.
38	R400 East of Moanvane	Loads will continue on the R400 heading south-east through a left bend.	Installation of Load Bearing Surface on the northeastern verge.
46/47	R400 / R419 Junction	Loads will head east on the R400 through two right bends then turn left onto the R419 at the junction heading northeast.	Installation of Load Bearing Surface on the south-eastern verge.

14.4.5.1 Existing Utilities and Overhead Lines

All overhead utilities and obstructions will be removed at any locations that the swept path analysis indicated possible conflict locations. The removal of overhead utilities will be either temporary disconnections or permanent re-routing. Such works will be carried out by the utility providers in advance of turbine delivery to site. This is standard practice, and the Contractor will engage with specific utility providers at TDR Node locations where overhead line works are required.

The permanent re-routing of overhead utilities will result in a temporary disruption to power and telecommunications services for existing residents and business and will also involve temporary road works to 'underground' these services. The location of the rerouting will be agreed with the utility provider.

A traffic management plan will be agreed with Laois County Council, Offaly County Council, and Kildare County Council in advance of any such works. Any trenching and road reinstatement works associated with utility diversions will be subject to a road opening license and is expected to be carried out in such a way as to ensure one lane of traffic will be open to traffic at all times. Such works will be carried out over a number of days.

However, if the permanent re-routing of overhead utilities is not possible, temporary disconnections of overhead lines will be required on several occasions to facilitate the delivery of turbine blades and will be carried out during the delivery of the components. Advance disconnection works will be carried out before the first turbine deliveries.

The schedule of turbine component deliveries will be determined by the turbine supplier however it is reasonable to assume that 7 convoys will be required to deliver all of the turbine components to site over the course of the turbine installation works which is expected to take place over the course of 6 months. This is based on a total of 7 no. loads per turbine to deliver blades, tower sections and nacelles, with each convoy consisting of components for two turbines at a time. Over the course of the installation period, it has been assumed convoys will be scheduled to deliver components to site every 4 weeks.

It is reasonable to assume a conservative scenario where temporary disconnections will be required during off peak times, on 7 different occasions over the course of 6 months (approximately once every month) to facilitate convoys, with a duration of several hours between disconnection and re-connection of services on each occasion. The impact on residents and businesses is assessed in Chapter 6, Population, Human Health and Chapter 17 Material Assets.

Temporary disconnections of overhead utilities will result in a significantly greater impact on local residents and businesses in terms of disruption to services than permanent diversions. It will also result in greater disruptions to traffic flows as the delivery of components through the town on each occasion will take slightly longer due to additional temporary works each time.

At TDR nodes where it has been identified that relocation of existing utilities is required to facilitate the temporary accommodation requirements, all such works will be carried out in advance of the formation of groundworks associated with the creation of new load bearing surfaces and all such activities will take place within the immediate vicinity of the proposed TDR node areas assessed in this EIAR.

14.4.5.2 Existing Structures Along TDR

There are existing watercourse crossing structures along the turbine delivery route that will be crossed by the proposed oversized loads associated with the delivery of turbine components.

The Route Survey Review (RSR) in Appendix 2.3 identifies the key issues associated with AIL deliveries and identifies remedial works, either in the form of physical works, vehicle modifications or traffic management interventions that will be required to accommodate the predicted loads.

14.4.5.3 Proposed Structures along the TDR

As part of the TDR accommodation works, it is proposed to install a new bridge crossing along the TDR at Node 29/30. This will involve the construction of 1 no. single span bridge crossing the Daingean River at Philipstown Bridge to facilitate the safe and efficient delivery of turbine components.

In addition, a temporary access track will be constructed through private lands and drainage infrastructure alongside the track. The entry point for this track will be located on the R402, with the exit point rejoining the public road network at the R400. Traffic on the R402 and R400 public roads will maintain priority over construction vehicles merging onto these roads during the construction of the temporary track and bridge crossing.

For further information on the traffic management of the proposed accommodation works at TDR Node 29/30, please refer to the Traffic Management Plan within Appendix 14.1, Volume III and Drawing Reference: P22-145-0300-0010.

14.5 Assessment of Likely Significant Effects

Likely impacts of the Proposed Development are outlined below, these are categorised in relation to the construction phase, operational phase and decommissioning of the project. The Do-nothing Scenario is also detailed.

14.5.1 Do-Nothing Scenario

If the proposed project is not constructed, there will be no change to the current road network and existing traffic patterns within the study area.

14.5.2 Construction

14.5.2.1 Main Wind Farm Site

The construction activities associated with the project will lead to additional construction related traffic on the existing public road network over the duration of the construction works. These impacts will include:

- Heavy Goods Vehicles (HGVs) transporting materials to and from the site, including road making materials, concrete, building materials, drainage/ducting materials, cabling, electrical components and excavated material.
- HGVs transporting conventional earthworks machinery such as excavators, dumper trucks and rollers.
- Fuel trucks transporting fuel for plant to each site compound during the construction phase
- Light Goods Vehicles (LGVs) such as cars, 4x4s and vans used by the workers and supervisory staff involved in the construction works.
- Oversized loads including turbine components (more details below).

Without appropriate mitigation measures, the proposed works have the potential to lead to a negative impact on the existing road network including:

- Delay and disruption to road users;
- Road safety issues should the works not be carried out in line with good traffic management practices;
- Inappropriate parking of construction related vehicles along the route of the works;
- Soiling of the public road leading to a general lack of cleanliness and poor skid resistance on roads;
- Damage to existing road surface.

Tree felling will be required as part of the Proposed Development. Haul routes used for felling activities will generally be the same as those identified for the project construction. Felling of 0.28 ha of forestry is required within and around the wind farm infrastructure to accommodate the construction of turbines, hardstands, crane pads, temporary compounds, access tracks and the proposed onsite substation.

For the purposes of assessing the worst-case scenario, it has been assumed that clearance felling for the project will take place at the start of the construction programme in advance of the commencement of the main balance of plant construction works. HGVs associated with the felling works will approach and leave the site via the route identified in Figure 14.2, Volume IV.

The following sawmills are in the vicinity of the Proposed Development:

- Clonmore Sawmills Limited, Clonmore, Tullamore, Co. Offaly
- Laois Sawmills, Ballymacken, Stradbally Road, Portlaoise, Co. Laois
- Hearts Wood Heritage, Iron Gate, Clongorey, Newbridge, Co. Kildare

All of the above sawmills are located close to motorways and national routes and area easily accessible from the project transport routes.

14.5.2.2 110kV On-Site Substation

Cable Works

The traffic impact associated with the grid connection cable works will fall into two main categories, the construction traffic related impacts and the road/lane closure related impacts.

The proposed grid connection is shown on Figure 2.3, Volume IV.

Construction Traffic Related Impacts

The cable route construction works will involve constantly moving the working area as the cable installation works progress. Grid works within the public road corridor and private electrical network cabling are estimated to take approximately 8 months on the assumption that an average of 75m-100m of cable is installed each day. The trenching and cabling works at the crossing points will be managed by a Stop/Go system without the need to close the road. Cable trenches can be excavated and covered using trench covers to maintain traffic flow.

Cabling and trenching works within the public road corridor are described in detail in section 5.4.2 of the Traffic Management Plan. These works will lead to additional traffic associated with the cable route construction.

Road/Lane Closure Related Impacts

The grid connection construction works will require a combination of temporary road closures with traffic diversions and temporary lane closures along the proposed route. Refer to Section 6.9 of Appendix 2.1B - Grid Connection Construction Methodology for the proposed traffic management plan for the proposed GCR.

All road works will be subject to a road opening licence, but it is anticipated that the cable installation along local roads will be advanced using a combination of rolling lane closures and temporary road closures where the existing road width is insufficient to accommodate an open lane for traffic to pass the works area.

The grid connection cable works by its nature will be isolated to a relatively small works area which will move daily. Impacts associated with the works will be experienced on the road network in the immediate vicinity to the works area.

Off-line sections of the proposed grid connection through private lands will not generate an impact to existing traffic flows.

Temporary road closures will be required at specific locations for the installation of joint bays and cable pulling and jointing operations at later dates. These activities are isolated and carried out in under a day at each location. Without appropriate mitigation measures, the proposed works have the potential to lead to a negative impact on the existing road network including:

- Delay and disruption to road users.
- Road safety issues should the works not be carried out in line with good traffic management practices;
- Inappropriate parking of construction related vehicles along the route of the works;
- Soiling of the public road leading to a general lack of cleanliness and poor skid resistance on roads;
- Damage to existing road surface.

These effects are short term in duration and slight in significance and considered likely during the construction stage. The likelihood of significant effects is slight.

14.5.2.3 Turbine Delivery Route

The delivery of turbine components including blades, tower sections and nacelles is a specialist transport operation owing to the oversized loads involved. The blades are the longest component and have been considered for the purpose of this assessment.

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 14.4.6, accommodation works are required along the turbine delivery route such as hedge or tree cutting, removal of wall sections, street furniture, vegetation, fences, temporary culverting of ditches and stream crossings, relocation of powerlines/poles, lampposts, signage and temporary local road widening through the laying of compacted load bearing aggregate to verges and roundabouts.

The impact of the construction of the proposed temporary accommodation works will be the increase in construction-related traffic on the local road network. This will have several potential effects, including:

- Delay and disruption to road users;
- Road safety issues should the works not be carried out in line with good traffic management practices;
- Inappropriate parking of construction related vehicles in the public road in the vicinity of the works areas;
- Soiling of the public road leading to a general lack of cleanliness and poor skid resistance on roads;
- Damage to existing public road infrastructure.

These effects are short term in duration and slight in significance and considered likely during the construction stage. The likelihood of significant effects is slight.

14.5.3 Operation

Traffic associated with the operational phase of the project will be associated with the wind farm owner/operator and grid network operator personnel visiting the substation, and maintenance staff. There will also be a limited infrequent attendance by routine environmental monitoring/compliance staff.

- **Routine Operational Traffic:** This includes vehicles for routine maintenance, environmental monitoring, and visits by the wind farm and grid network operators. The proposed substation has been designed in accordance with network operator requirements with welfare facilities. However, they will not require full time operational staff and will be largely automated with occasional visits from maintenance teams.
- **Non-Routine/Unplanned Traffic:** This is for emergency repairs or major component replacements, such as a turbine blade. This impact would involve the mobilisation of large plant like a crane and construction personnel. Unforeseen or unplanned events such as emergency turbine repair works could potentially require the mobilisation of construction plant and personnel to site. The replacement of a large turbine component such as a blade will require a crane and the re-installation of some TDR temporary accommodation requirements.

A cable fault along the grid connection could potentially require temporary road works for intrusive investigations and repair. The above unplanned events are extremely unlikely to occur.

The significance of the effects is directly tied to their likelihood and magnitude for the operational phase. The routine operational traffic is minimal, and the effects are considered not significant. The number of vehicles is very low, and the frequency is infrequent, so no meaningful change to the existing road network's function is expected.

For Non-Routine Traffic, while the effects of a major repair could be significant in isolation (e.g., a large crane temporarily blocking a road), these events are extremely unlikely to occur.

Therefore, the likelihood of significant effects from the operational phase is negligible. The vast majority of traffic is minor, and the events that could cause significant effects are unlikely that they do not pose a credible risk to the road network.

14.5.4 Decommissioning

On decommissioning, cranes will disassemble the above ground turbine components which will be removed off site for recycling. All the major component parts are bolted together, so this is a relatively straightforward process.

The foundation pedestals will be covered over and allowed to re-vegetate naturally. Leaving the turbine foundations in situ is considered a more environmentally sensible option as to remove the reinforced concrete associated with each turbine would result in environmental impacts such as noise dust and vibration.

It is proposed that all the internal site access tracks and turbine hard standings will be left in place. These will continue to be used for recreation, forestry and agriculture. Turbine hardstandings will be covered over with topsoil previously stripped and used for landscaping purposes during the construction stage and left to revegetate naturally. The recreational trails and associated signage will be left in situ.

The temporary accommodation requirements along the TDR will not be required for the decommissioning phase as turbine components can be dismantled on site and removed using standard HGVs.

Grid connection infrastructure including the on-site substation and ancillary electrical equipment will form part of the national grid and will be left in situ.

While some minor, temporary effects like localised noise and traffic will occur, these are not considered significant in the context of the project's overall lifecycle and the mitigation measures proposed.

The likelihood of significant effects from the decommissioning phase is considered low. This phase is of short-term duration, expected to take no longer than six months to complete. The associated traffic impact will be significantly less than the construction phase due to a considerably lower number of vehicle movements.

Leaving the turbine foundations in place avoids the most significant potential environmental effects, such as major noise, vibration, and dust generation. Furthermore, the decision to leave the hardstandings and access tracks for future use and to allow the turbine hardstanding areas to naturally revegetate will limit overall environmental disturbance and facilitate a positive transition for the site's future use. The decommissioning plan will ensure the site is left in an environmentally enhanced state for future generations.

The decommissioning phase of the Proposed Development is described in Chapter 2 of this EIAR.

14.6 Impact Assessment

14.6.1 Construction

The estimated construction phase traffic generated by the project on the surrounding road network has been calculated by estimating the number of vehicles required for each phase of the Proposed Development (construction, operation and decommissioning). The number of vehicles is then converted to the equivalent two-way trips, whereby every vehicle will generate two trips, one to and one from the site.

To assess the impact of the additional construction related traffic on the existing road network it is first required to estimate the amount of construction traffic that will be generated (trip generation) as a result of the Proposed Development.

This assessment was done by estimating the amount of traffic, in the form of heavy goods vehicles (HGV) and light goods vehicles (LGV) that will be generated during the construction phase and then distributing it over the duration of the construction programme. In determining the number of 'trips' the estimated number of HGV vehicles was multiplied by a factor of 2 to account for a single trip 'in' and a corresponding single trip 'out'. This is best practice and in line with relevant guidelines outlined in Section 14.2.3.

In the case of LGVs, the estimated number of vehicles was multiplied by 2.5 to account for some additional LGV movements e.g. some workers taking lunch breaks in the local area. The analysis allowed for a total number of trips per month to be calculated. This could be translated to annual average trips per day (AADT).

Some key assumptions taken when preparing the trip generation estimates include:

- An average ready mix concrete truck carries a load of approximately $8m^3$ of concrete
- An average tipper truck carries approximately $10m^3$ of soil/rock/aggregate
- A construction period of 24 months is expected based on the nature and scale of the proposed works
- It has been assumed that cable trenching works associated with the construction of the grid connection and internal cabling works is expected to take 8 months to complete and will be carried out in parallel with the wind farm construction where practical
- An average of 1.5m of engineering fill will be imported for the formation of wind turbine foundations per turbine
- An average of 1.5m of engineering fill will be imported for the formation of wind turbine hardstanding areas per turbine
- An average of 0.6m of engineering fill will be imported for the formation of floated access track
- An average of 0.45m of engineering fill will be imported for the formation of new access track

Project related traffic will vary over the course of the construction programme. Activities can be broken up into the following main categories:

- Mobilisation and site setup
- Site clearance and felling
- Internal access tracks
- Turbine hard standings
- Turbine foundations
- TDR Accommodation Works
- Turbine Installation
- Onsite substation
- Private electrical network
- Grid connection cable works
- Testing and Commissioning
- Landscaping, reinstatement, demobilisation.

Plate 14-4 shows construction stage vehicle trips and their distribution across the 24-month construction programme for the entire project.

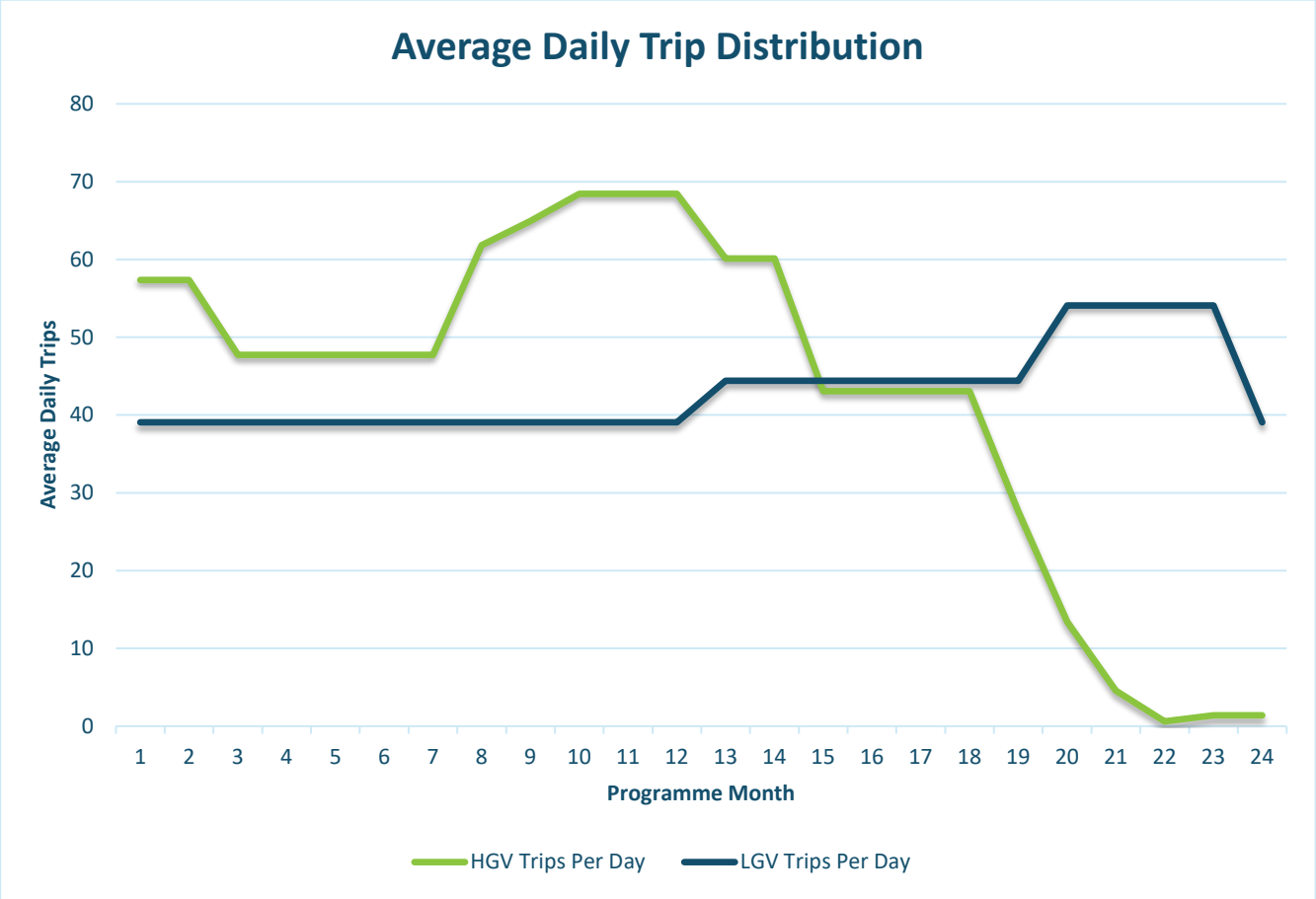

Plate 14-4: Average Daily Trip Distribution – Project Including Grid Connection Cable Work

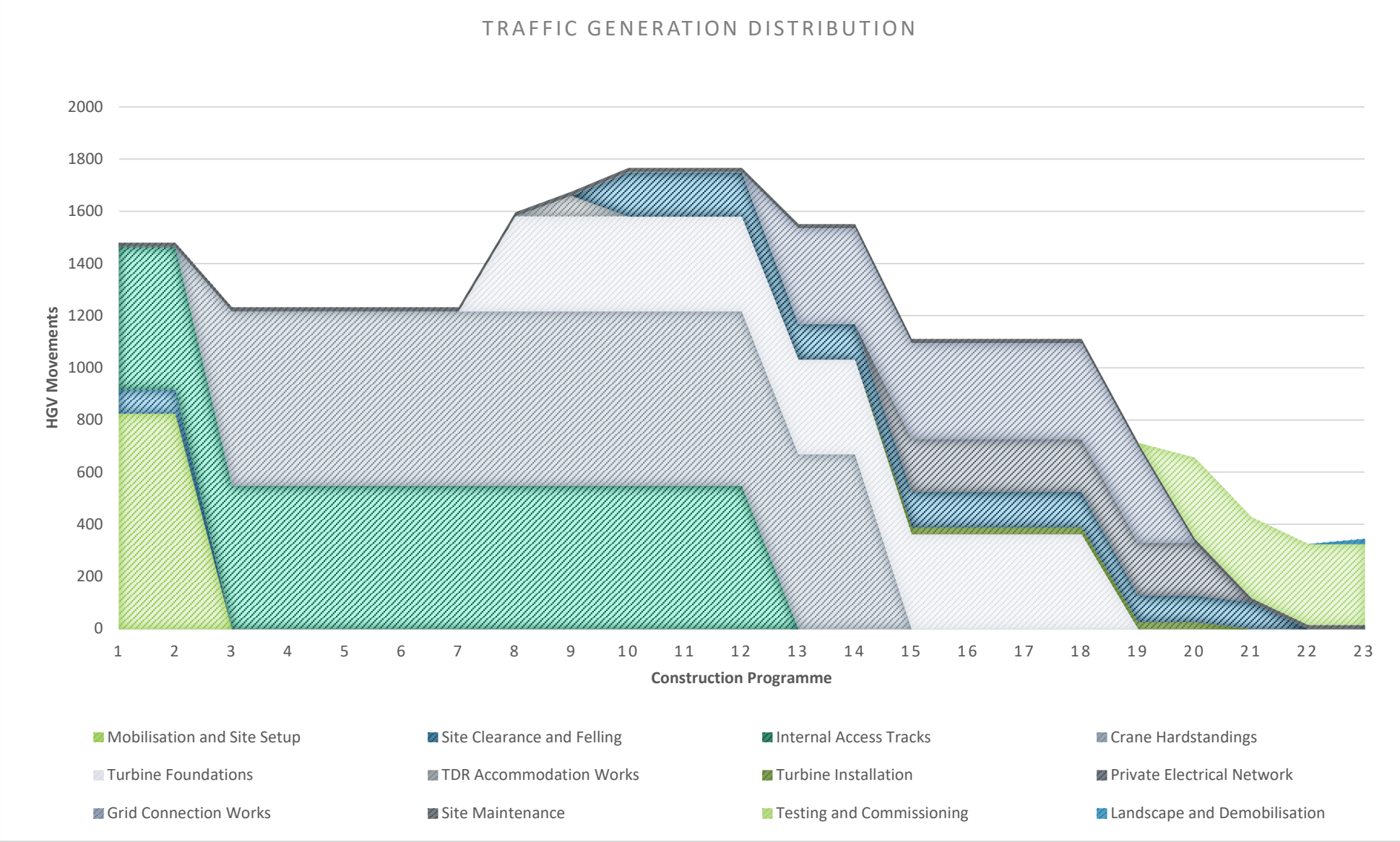

Plate 14-5: Cumulative HGV Trip Distribution - Including Grid Connection Works

It is estimated that construction phase for the Proposed Development will lead to 26,495 additional HGV trips (two-way) over the duration of the construction works.

Calculations of HGV movements associated with the construction of the project indicate an average daily increase of 43 HGV trips per day over a construction period of 24 months. This increases to 68 HGV trips per day during peak months which occur in months 10 - 12 inclusive for HGV traffic.

An average workforce of 30 persons is anticipated, increasing to 40 persons during peak periods. This is estimated to give rise to an increase of LGV traffic of 43 trips per day on average rising to 54 trips during peak construction periods which occur for LGV traffic during months 20 – 23 inclusive.

The combined HGV and LGV average daily increases are 86 trips per day throughout the construction programme.

The busiest period during the construction programme is expected to occur in months 10 - 12 inclusive when multiple construction activities take place concurrently. These activities include access tracks, crane hard standing, foundation construction, and on-site substation construction works.

It should be noted that the traffic increases are conservative and include all construction stage traffic associated with the Proposed Development including the cabling works.

The following sub-sections assess the impacts associated with the various elements of the Proposed Development. The construction of the proposed cabling works within the public road and the private electrical network has been separated from the rest of the project as these works will be isolated from the main wind farm site works (i.e. cabling works will take place on the opposite side of the site during hardstand construction and foundation pours to facilitate trenching works in or adjacent to the access track) and carried out by a largely independent construction team.

14.6.1.1 Main Wind Farm Site

The volume and distribution of vehicle trips generated by the construction of the main wind farm site are presented in Plate 14-6.

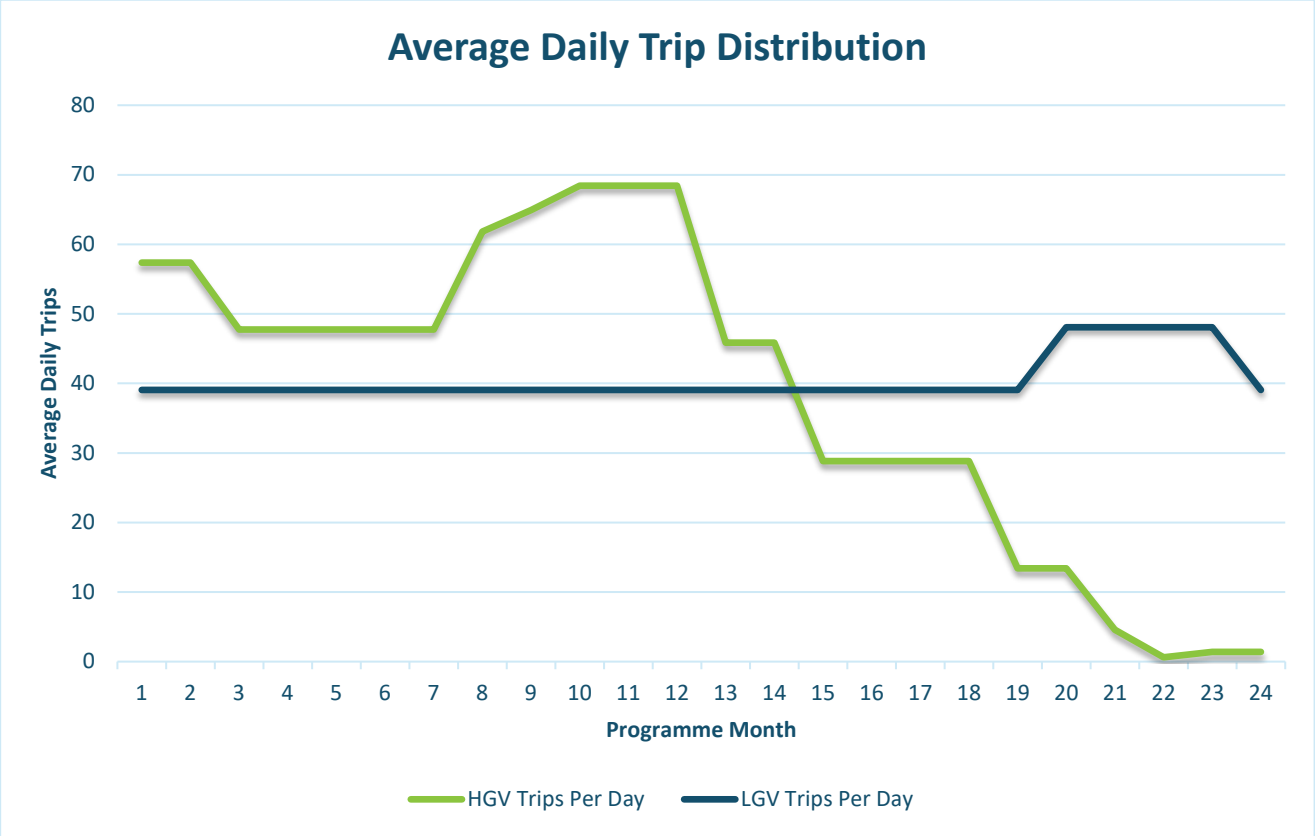

Plate 14-6: Average Daily Trip Distribution - Project Excluding Cabling Works

It is estimated that the construction phase for the main wind farm site will lead to 23,927 additional HGV trips (two-way) over the duration of the construction works.

Calculations of HGV movements associated with the construction works indicate an average daily increase of 39 HGV trips over the course of the construction programme. The peak months for HGV trips occur in months 10 to 12 inclusive where average daily HGV trips rise to 68.

An average workforce of 30 persons is anticipated, increasing to 40 persons during peak periods. This is calculated to give rise to an average daily increase of 41 LGV trips per day over a construction period of 24 months. The peak months for LGV trips occur in months 20 to 23 inclusive where average daily LGV trips rise to 48.

The combined HGV and LGV average daily increase for the wind farm site excluding grid connection works is 79 trips per day throughout the construction programme.

The works will result in a temporary increase in traffic volumes of 0.32% on the M6, 0.68% on the N52, and 0.24% on the R419. These roads form part of the TDR and haul routes for the construction of the project but do not form part of the grid connection cable route.

The local and regional roads near Monasterevin (R424, R414, and L7176) will see an increase in traffic volumes over the course of the construction phase of ca. 0.79-2.75%. These roads form part of or are in the vicinity of the GCR. The percentage increases of HGV traffic on these roads network are quite high as shown, however, the actual number of HGVs currently using these roads are very low which gives the impression of a significant short-term impact when in reality there is not. The local road network will continue to operate well within carrying capacity with the additional construction traffic from the development.

Based on the above, negative or adverse effects on the receiving environment associated with the construction works at the main wind farm site are considered to be short-term in duration and moderate in significance without appropriate mitigation.

14.6.1.2 Grid Connection

The volume and distribution of vehicle trips generated by the construction of the grid connection cable works are presented in Plate 14-7.

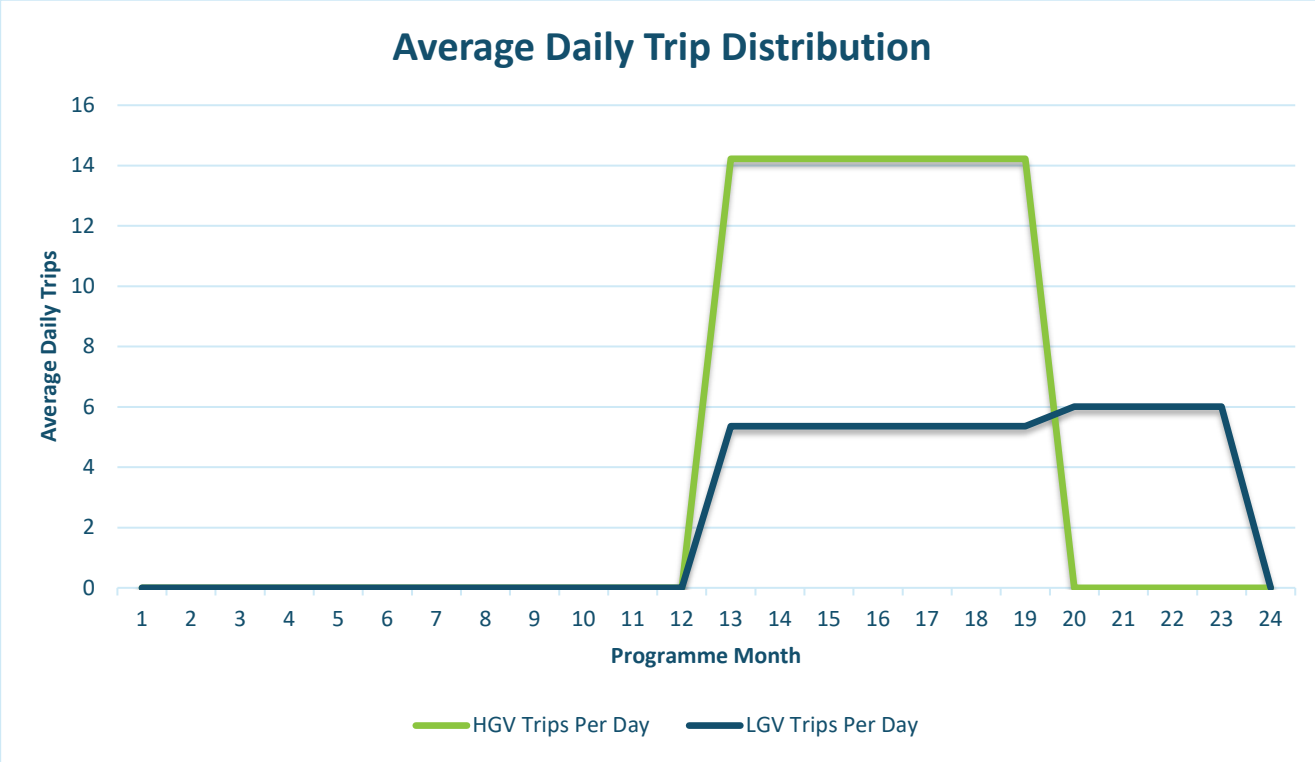

Plate 14-7: Average Daily Trip Distribution - Cabling Work

It is estimated that the construction phase for the grid connection cable works will lead to 2,569 additional HGV trips (two-way) over the duration of the construction works.

Calculations of HGV movements associated with the construction works indicate an average daily increase of 4 HGV trips per day over the course of the construction programme. The peak months for HGV trips occur in months 13 to 19 inclusive where average daily HGV trips rise to 14.

The workforce associated with this activity is expected to give rise to an average daily increase of 3 LGV trips per day over the course of the construction programme. The pattern of LGV trips will remain relatively steady throughout the construction works and does not exceed 6 LGV trips per day on average over a 24-month duration.

The combined HGV and LGV average daily increases are 7 trips per day and does not exceed 20 trips per day throughout the construction programme.

As described in Section 14.5.2.2, the cabling works will involve constantly moving the working area as the cable installation works progress along the route. Adverse impacts associated with the works will therefore be experienced on the road network in the immediate vicinity to the works area. Should the construction of the grid connection works be split over two or more works areas, this would result in a significant reduction in overall construction time. This approach would also have the effect of increasing the overall average number of construction vehicle trips per day associated with the construction of the grid connection, albeit over a shorter timeframe. In such a scenario, as each of the works areas would be isolated from each other, the impacts associated with the works at each location would be as described above for that locality and would not act cumulatively with each other.

The works will result in a total traffic volume temporary increase of approximately 1.7% on the R414, 7.5% on the R424, and 111.6% on the L7176. It is likely similar increases will be experienced on the R420, L70481, L71764, L7050, L7051 and the L71761.

These local roads along the cabling route, turbine delivery and haul routes will see a higher temporary increase in traffic volumes over the course of the construction phase for reasons previously stated in the analysis of the wind farm traffic impact. While the overall temporary increase in traffic volumes can be considered low, there will be a noticeable temporary uplift in traffic as a result of the cabling works along these local roads throughout the duration of the works. Construction traffic associated with the cabling works will average less than 1 no. trip per hour and is not expected to exceed 2 no. trips per hour throughout the duration of the works.

Based on the above negative or adverse effects on the receiving environment associated with the construction of the grid cabling works are considered to be short-term in duration and slight to moderate in significance without appropriate mitigation in accordance with EPA guidelines.

14.6.1.3 Turbine Delivery Route

Impacts along the TDR will be limited to specific locations where temporary accommodation works are required and on occasions where large turbine component deliveries are brought to the site. Temporary accommodation works are at isolated locations and will not generate significant construction traffic.

It has been assumed that all turbine blades will be carried on a on a Superwing Carrier trailer to reduce the need for mitigation in constrained sections of the route.

The removal of overhead utilities will be either temporary disconnections or permanent re-routing. Such works will be carried out by the utility providers in advance of turbine delivery to site.

The permanent re-routing of overhead utilities will result in a temporary disruption to power and telecommunications services for existing residents and business and will also involve temporary road works to 'underground' these services. In addition, a traffic management plan will be agreed with Kildare County Council, Laois County Council and Offaly County Council in advance of any such works. Any trenching and road reinstatement works associated with utility diversions will be subject to a road opening license and can be carried out in such a way as to ensure one lane of traffic will be open to vehicles on the road at all times. Such works will be carried out over a number of days.

However, if the permanent re-routing of overhead utilities is not possible, temporary disconnections of overhead lines will be required on several occasions to facilitate the delivery of turbine blades and will be carried out during the delivery of the components. Advance disconnection works will be carried out before the first turbine deliveries. The schedule of turbine component deliveries will be determined by the turbine supplier however it is reasonable to assume that several convoys will be required to deliver all the turbine components to site over the course of the turbine installation works which is expected to take place over the course of 5 months.

It is reasonable to assume a conservative scenario where temporary disconnections will be required during off peak times, on up to six different occasions over the course of six months to facilitate convoys, with a duration of several hours between disconnection and re-connection of services on each occasion.

Temporary disconnections of overhead utilities will result in a significantly greater impact on local residents and businesses in terms of disruption to services than permanent diversions. It will also result in greater disruptions to traffic flows as the delivery of components through the town on each occasion will take slightly longer due to additional temporary works each time.

Negative or adverse effects on the receiving environment associated with the turbine delivery route are considered to be temporary in duration and slight to moderate in significance without appropriate mitigation.

14.6.2 Operation

The trip generation for the operational stage of the Proposed Development is anticipated to be minimal as both the wind farm and substations will be operated remotely as described in Section 14.5.3. Effects on the receiving environment associated with the operation phase of the Proposed Development are considered to be neutral in terms of quality, long-term in duration and imperceptible in significance. They are not likely to generate significant effects.

Maintenance work on the hedgerows and treelines near the site entrance will take place twice per year in accordance with Section 40 of the Wildlife Act 1976 as amended by the Wildlife (Amendment) Act 2000 and the Heritage Act 2018. Hedgerow maintenance will not take place from March 1st to August 31st, except where strictly necessary for road safety reasons.

For unforeseen or unplanned works, it is predicted that negative or adverse effects on the receiving environment will be temporary in duration and slight in significance without appropriate mitigation in accordance with EPA guidelines. They are not likely to generate significant effects.

14.6.3 Decommissioning

Impacts associated with the decommissioning of the Proposed Development will be similar in nature to the construction stage but of a much lower magnitude primarily due to the following key reasons:

- Wind farm access tracks will be left in-situ;
- The grid connection will form part of the grid network and will be left in place;
- Wind turbine components will be dismantled on site and can be removed on standard HGV's eliminating the requirement for temporary accommodation requirements needed at construction stage.

Negative or adverse effects on the receiving environment associated with decommissioning works at the main wind farm site are considered to be temporary in duration and slight in significance without appropriate mitigation. Project related traffic generated during the decommissioning phase will be significantly less than that associated with the construction phase. The temporary negative impact on the public road network would not be significant.

Infrastructure associated with the grid connection will form part of the national transmission and distribution system and will be left in-situ. Therefore, no impacts are envisaged upon decommissioning of the grid connection and no mitigation is required.

Negative or adverse effects on the receiving environment associated with the turbine delivery route are considered to be temporary in duration and slight in significance without appropriate mitigation.

14.6.4 Pre-mitigation Impact Assessment

Without appropriate mitigation measures, the construction works have the potential to lead to a negative impact on the local road network including:

- Delay and disruption to road users;
- Road safety issues, should the works not be carried out in line with good traffic management practices
- Damage to roads without the correct reinstatement;
- Inappropriate parking of construction vehicles along the route of the works;
- Soiling of the public road leading to a general lack of cleanliness and poor skid resistance on roads.

Based on the above, negative or adverse effects on the receiving environment associated with the construction works at the Wind Farm site will be short-term in duration and slight in significance without appropriate mitigation. The decommissioning phase is not likely to generate significant effects.

14.7 Mitigation Measures

14.7.1 Construction

14.7.1.1 Main Wind Farm Site

This section outlines the mitigation measures that will reduce, minimise or eliminate the potential impacts created by the project and outlined above.

The following mitigation measures are proposed to reduce the impact of the construction activity in relation to the construction phase of the project:

Traffic Management Plan

A Preliminary Traffic Management Plan has been completed and is found in Appendix 14.1, Volume III. The traffic management plan (TMP) will be agreed with the road's authority and An Garda Siochána prior to commencing construction.

14.7.1.2 Grid Connection Works

Mitigation measures that will be implemented in full for the grid connection works include:

Road Opening: The road works associated with cable trenching works will be completed in line with the requirements of a road opening license as agreed with the local authority.

Route Proofing: In advance of the cabling works an assessment will be carried out to define the precise alignment of the cable route within the corridor which has been assessed. This will include slit trenching with the aim of minimising the construction impacts and avoiding existing services in the road.

Road Cleanliness: Appropriate steps will be taken to prevent soil/dirt generated during the works from being transported on the public road. Road sweeping vehicles will be used, when necessary, to ensure that the public road network remains clean.

Temporary Trench Reinstatement: Trenches on public roads, once backfilled, will be temporarily reinstated to the satisfaction of the roads authority.

Surface Overlay after Trench Reinstatement: Following temporary reinstatement of trenches on public roads, sections of the public roads will receive a full surface overlay. Details will be agreed with the roads authority. At a minimum they will be reinstated to their pre-works condition or better and to the satisfaction of the roads authority.

Maintain local access during diversions and road closures: Reasonable access to local dwellings, farms and businesses will be maintained at all times during any road closures associated with the cable works. The details of this will be agreed with the roads authority in advance of the works in consultation with the local residents in so far as is practicable. The network of local roads in the area will be used for traffic diversions for local traffic in order to expedite the works and limit the duration of the impact owing to the cabling works. In the event of an emergency, steel plates (kept on site) can be placed over open trenches to temporarily restore traffic flow.

Consultation: Consultation with local residents will be carried out in advance of road closures.

14.7.1.3 Turbine Component Delivery Mitigation

The turbine delivery route has been assessed using a detailed appraisal of potential routes and the identification of the most appropriate route including the accommodation requirements along the route to mitigate the impact of the turbine delivery. The impact of the deliveries on traffic is mitigated by delivering components during off-peak or night-time deliveries.

Mitigation measures proposed for the turbine delivery route also include:

Programme of Deliveries: A programme of deliveries will be submitted to the roads authority in advance of deliveries of turbine components to the site. The programme will include details of the dates and times of each component delivery along with the route to be taken. Turbine component deliveries will be carried out during off-peak times and will be done using a convoy and a specialist heavy haulage company.

Unloaded Trial Run: Vehicles with similar dimensions of the abnormal load vehicles will complete an unloaded run of the route to ensure all temporary accommodation works are suitable for the loaded convoy.

Garda Escort: Turbine deliveries will be escorted by An Garda Siochána. This will ensure the impacts of the turbine deliveries on the existing road network are minimised.

Reinstatement: Any area affected by the works on the public road to facilitate turbine delivery will be fully reinstated to its original condition.

Consultation: Consultation with the local residents and Laois County Council, Kildare County Council, and Offaly County Council will be carried out in advance to manage turbine component deliveries.

14.7.2 Operation

The site entrance will be maintained continually to ensure visibility conditions at these entrances has not deteriorated. Hedgerow maintenance will be required periodically to ensure continued visibility at site entrances.

14.7.3 Decommissioning

The traffic impact associated with the decommissioning phase will be significantly less than the construction phase.

Infrastructure associated with the grid connection will form part of the national transmission network and will be left in-situ. Therefore, no impacts are envisaged upon decommissioning of the wind farm project and no mitigation is required.

Mitigation measures adopted for project decommissioning will be in line with those identified for the construction phase of the project.

All decommissioning works will be carried out in accordance with a decommissioning plan to be agreed with the planning authority in advance of the decommissioning works. Traffic management measures identified will be included in the decommissioning plan for the wind farm.

14.8 Residual Effects

The implementation of mitigation measures outlined in Section 14.7 will ensure that residual effects are minimised throughout the duration of the proposed activities.

14.8.1 Construction

Negative or adverse effects on the receiving environment associated with the construction works on the main wind farm site are considered to be short-term in duration and slight in significance following mitigation.

Negative or adverse effects on the receiving environment associated with the turbine delivery route are considered to be temporary in duration and slight following mitigation.

Negative or adverse effects on the receiving environment associated with the construction of the grid connection are considered to be short-term in duration and slight in significance following mitigation.

14.8.2 Operation

The trip generation for the project once operational is anticipated to be minimal.

Effects on the receiving environment associated with the operation phase of the project are considered to be neutral in terms of quality, long-term in duration and imperceptible in significance.

For unforeseen or unplanned works such as emergency turbine repair works described in Section 14.5.3, it is considered that negative or adverse effects on the receiving environment will be temporary in duration and not significant to slight following appropriate mitigation.

14.8.3 Decommissioning

Negative or adverse effects on the receiving environment associated with decommissioning works at the wind farm site are considered to be temporary in duration and not significant following mitigation.

Negative or adverse effects on the receiving environment associated with the turbine delivery route are considered to be temporary in duration and not significant following mitigation.

Infrastructure associated with the grid connection will form part of the national transmission network and will be left in-situ. Therefore, no impacts are envisaged upon decommissioning of the project and no mitigation is required.

Table 14-7: Summary of Residual Impacts

Phase	Project Element	Main Receiving Environment	Description of Potential Effect		
			Duration	Quality	Significance
Construction	Main Wind Farm Site	R419, R400, L70481 and surrounding local road network	Short-term	Negative/Adverse	Slight
	Turbine Delivery Route	R339, R338, R336, N6, M6, N52, R420, R402, R400, R419	Temporary	Negative/Adverse	Slight
	Grid Connection	L70481, L71764, L7050, L7051, L7176, L71761, R424, and R420	Short-term	Negative/Adverse	Slight
Operation	Main Wind Farm Site	R419, R400, L70481 and surrounding local road network	Long-term	Neutral	Imperceptible
	Turbine Delivery Route	R339, R338, R336, N6, M6, N52, R420, R402, R400, R419	Long-term	Neutral	Imperceptible
	Grid Connection	L70481, L71764, L7050, L7051, L7176, L71761, R424, and R420	Long-term	Neutral	Imperceptible
Decommissioning	Main Wind Farm Site	R419, R400, L70481 and surrounding local road network	Temporary	Negative/Adverse	Not significant
	Turbine Delivery Route	R339, R338, R336, N6, M6, N52, R420, R402, R400, R419	Temporary	Negative/Adverse	Not significant
	Grid Connection	L70481, L71764, L7050, L7051, L7176, L71761, R424, and R420	Temporary	Negative/Adverse	Not significant
Unplanned Events (i.e. Accidents)	Main Wind Farm Site	R419, R400, L70481 and	Temporary	Negative/Adverse	Not significant - Slight

Phase	Project Element	Main Receiving Environment	Description of Potential Effect		
			Duration	Quality	Significance
		surrounding local road network			
	Turbine Delivery Route	R339, R338, R336, N6, M6, N52, R420, R402, R400, R419	Temporary	Negative/Adverse	Not significant - Slight
	Grid Connection	L70481, L71764, L7050, L7051, L7176, L71761, R424, and R420	Temporary	Negative/Adverse	Not significant - Slight

14.9 Cumulative Impacts

All known existing and proposed developments within the cumulative study area of 20km that could potentially generate a cumulative impact with Derrynadarragh Wind Farm in relation to traffic and transportation during construction, operation and decommissioning were identified and examined as part of this assessment. Please refer to Appendix 1.3, Volume III of the EIAR for further detail. Furthermore, Table 14-8 provides details of the renewable energy developments within the study area that were considered for cumulative impacts.

The existing renewable energy developments and planning applications listed in Table 14-8 below were obtained from a planning search on the Offaly County Council, Kildare County Council, and Laois County Council Planning Websites, accessed in December 2025 and through consultation with the local roads department engineers. The search included developments lodged within the last 10 years within 20km of the Site. Please refer to section 2.3.2 of Chapter 2, Volume II of the EIAR, for the rationale around the proposed study area. The extent of the study area recommended within Wind Energy Development Guidelines (WEDG) (2006/2019) is 20km from the outer most turbines of the scheme.

Table 14-8: Cumulative Energy Developments within 20 km of the Proposed Wind Farm Site

Development Name	Number of Turbines	Distance and Direction from Proposed Site	Status
Cloncreen Wind Farm	21	10.6km to the north of the site	Operational since 2022.
Mount Lucas Wind Farm	28	11.1km to the north of the site	Operational since 2015.
Cushaling Wind Farm	9	12km to the north-east of the site	Permitted since 2020 & construction started in 2022.
Moanvane Wind Farm	12	18.6km to the west of the site	Permitted since 2018 & construction started in 2022.

Development Name	Number of Turbines	Distance and Direction from Proposed Site	Status
Yellow River Wind Farm	29	c.19km to the north of the site	Permitted since 2022 & construction began in 2022, with an expected completion date in 2025.
Dernacart Wind Farm	8	c.15km west of the site	High Court Ruled in favour of this development in June 2025. An Bord Pleanala (now An Coimisiun Pleanala) approved the development in January 2024 (Appeal Case Ref: 310312)
Treascon Solar Farm	n/a	c.2Km southwest of the site	Permitted July 2024, construction not started yet. (Planning ref: 318436)
Cappakeel Solar Farm	n/a	c.11km south of the site	Granted by LPA in September 2025 (Ref: 2560148), Appealed, Pending Decision by ACP (Ref: PL-500061-LS)
Clonarrow Wind Farm	4	c.12km to the north of the site	Currently in Planning and awaiting decision (Planning Ref: 2560189)
Ballydermott Wind Farm	47	c.7.7km to the southeast of the site	Pre-Application Stage
Cushina Wind Farm	11	c.4.3km northwest of the Site	Pre-Application Stage

14.9.1 Cloncreen Wind Farm

Cloncreen Wind Farm encompasses 21 turbines of approximately 3.45MW with a combined output of approximately 75MW. The development is located approximately 10.6km north (straight line distance) of the Derrynadarragh Wind Farm and has been operational since 2022. It is considered that no cumulative impact will be created as a result of this development during the operation or decommissioning phases of the Derrynadarragh Wind Farm.

14.9.2 Mount Lucas Wind Farm

Mount Lucas Wind Farm, consisting of 28 turbines of approximately 3MW and a combined output of 84MW, is located approximately 11.1km north (straight line distance) of the Derrynadarragh Wind Farm. It has been in operation since 2015. It is considered that no cumulative impact will be created as a result of this development during the operation or decommissioning phases of the Derrynadarragh Wind Farm.

14.9.3 Cushaling Wind Farm

Cushaling Wind Farm comprising of 9 no. 6.2MW turbines (combined output of approximately 55MW) is located approximately 12km north-east (straight line distance) of the Derrynadarragh Wind Farm. Planning permission was granted in 2020, and construction began in 2022. Construction is expected to be completed prior to the construction of the proposed development and therefore, no cumulative impact is expected.

It is also considered that no cumulative impact will be created as a result of this development during the operation or decommissioning phases of Derrynadarragh Wind Farm.

14.9.4 Moanvane Wind Farm

Moanvane Wind Farm consists of 12 turbines of approximately 4.8MW with a combined output of approximately 57.6MW. The development is located approximately 18.6km west (straight line distance) of the Derrynadarragh Wind Farm. Planning permission was granted in 2018, and construction began in 2022. Construction is expected to be completed prior to the construction of the proposed development; therefore, no cumulative impact is expected.

It is also considered that no cumulative impact will be created from this development during the operation or decommissioning phases of Derrynadarragh Wind Farm.

14.9.5 Yellow River Wind Farm

Yellow River Wind Farm, consisting of 29 no. 3.6MW turbines with a combined output of approximately 101MW, is situated approximately 19km north (straight line distance) of Derrynadarragh Wind Farm. Planning permission was granted in 2022, and construction began the same year, with an expected completion date in 2025. Construction is expected to be completed prior to the construction of the proposed development; therefore, no cumulative impact is expected.

It is also considered that no cumulative impact will be created as a result of this development during the operation or decommissioning phases of Derrynadarragh Wind Farm.

14.9.6 Dernacart Wind Farm

Dernacart Wind Farm comprises of 8 turbines of approximately 5MW with a combined output of approximately 40MW and associated site development works. The development is located approximately 10km west (straight line distance) of the Derrynadarragh Wind Farm. Conditional planning permission was granted in 2024, but construction has not yet commenced due to environmental concerns, which are still ongoing.

The turbine deliveries are likely to come from Dublin port where it will travel along the M6 and the N52, before finally travelling along the N80 to the site entrance at Dernacart. The proposed Dernacart Wind Farm shares a common delivery route with the Derrynadarragh Wind Farm from Junction 5 of the M6, along the N52 until the turn off for the R420. The route is shared for approximately 11.5km and any temporary accommodation works for abnormal load deliveries along the route could be kept in place for both projects should the construction programs align.

Upon review of the EIAR for Dernacart Wind Farm, there are four potential quarries that they plan to source construction materials from. The Dernacart Wind Farm may share a portion of the haul route with the Derrynadarragh proposed development, should they source material from Roadstone Tullamore or Molloy's Quarry Tinycross, both in Co. Offaly. The EIAR also states that the project will utilise a borrow pit to source stone and gravel which would reduce the need for importing external aggregate and reduce the cumulative impact on the surrounding road network.

The GCR for both the Dernacart Wind Farm and Derrynadarragh Wind Farm intend to connect to the existing Bracklone substation. However, they approach it from opposite directions and do not share a common GCR. Therefore, cumulative effects are not expected from the GCR.

It is estimated that during civil construction, approximately 14,516 HGV loads will be delivered to the Dernacart site. This breaks down to approximately 1,210 loads per month excluding Sundays and bank holidays assuming a 12-month construction programme as stated in the EIAR.

Potential negative cumulative effects on the road network are anticipated to have a temporary impact and slight to moderate in significance during the construction phase.

The wind farm does not generate any perceptible levels of traffic during operation as it is remotely operated. In the highly unlikely event of a significant turbine component replacement during the Derrynadarragh Wind Farm operational phase, this will involve a small number of HGV trips and potential abnormal load deliveries along the TDR route over a short period of time.

It is considered that no cumulative effect will be created as a result of this development during the operation or decommissioning phases of the Derrynadarragh Wind Farm.

14.9.7 Treascon Solar Farm

Treascon Solar Farm (Planning Ref: 318436) is located approximately 2km southwest of the Derrynadarragh Wind Farm site. The project was permitted in July 2024; however, construction has not yet begun.

The proposed grid connection for Treascon Solar Farm follows the L1006 and does not overlap with the grid connection route for the Derrynadarragh Wind Farm.

There is a short section of overlap between the haul routes for the Treascon Solar Farm and the Derrynadarragh Wind Farm along the R419. However, the Derrynadarragh Wind Farm uses this road for only 1.10km of its TDR and haulage routes. Construction traffic for Treascon Solar Farm is expected to remain relatively low, with an average of 44 two-way HGV movements per week and significantly reduced volumes for over half of the 17-month programme. As a result, any cumulative impact on the road network is anticipated to be minimal.

Operational traffic will be minimal, as the facility will be remotely monitored with bi-weekly to monthly visits. Decommissioning traffic is also expected to be modest. It is considered that no cumulative effect will be created as a result of this development during the operation or decommissioning phases of the Derrynadarragh Wind Farm.

14.9.8 Cappakeel Solar Farm

Cappakeel Solar Farm, which has a 10-year permission and 40-year operational life, is located approximately 11km south of Derrynadarragh Wind Farm. The development will consist of a solar farm on 5 no. land parcels at the townlands of Morett, Killone, Cappakeel, Rossmore and Raheennahown north, County Laois, and an onsite Loop-In-Loop-Out (LILO) 110kV Substation compound.

As the proposed 110kV substation will provide a LILO grid connection to the national grid via. an existing overhead line, there will be no cumulative effects expected on the road network associated with the GCR for Derrynadarragh Wind Farm.

Construction activity will generate additional traffic on the surrounding road network, particularly along the M7, R445, L-3920 and L-7815. The construction phase is expected to last 18 months and generate approximately 15,992 two-way HGV trips, equating to an average of 34 HGV movements per day and up to 69 per day during peak periods. The delivery and haul routes for the Cappakeel Solar Farm differ from those of the Derrynadarragh Wind Farm, as the project intends to source its construction materials from Arkil Quarry in Drennanstown, Rathangan, Co. Kildare.

Traffic to the site during the operational phase would average 1 visit per week and the impact on the public road network is considered negligible. In addition, project related traffic generated during the decommissioning phase will be significantly less than that associated with the construction phase. The temporary negative impact on the public road network is considered to be not significant.

It is considered that no cumulative effect will be created as a result of this development during the operation or decommissioning phases of the Derrynadarragh Wind Farm.

14.9.9 Clonarrow Wind Farm

Clonarrow Wind Farm comprises the erection of 4 wind turbines and associated site development works. The development, which is currently in Planning, is located approximately 12km north of Derrynadarragh Wind Farm. A 10-year planning permission and a 35-year operational lifespan from the date of commissioning of the entire wind farm are being sought.

The turbine components will be transported from Galway Port, Co. Galway to site via the N6, M6, N52, L2025, R402 and the L50203. The proposed Clonarrow Wind Farm shares a common delivery route with the Derrynadarragh Wind Farm from Junction 5 of the M6, along the N52 for approximately 10.3km until the turn off for the L2025. The route rejoins the common delivery route on the R402 for 7.5km. Any temporary accommodation works for abnormal load deliveries along the route could be kept in place for both projects should the construction programs align.

Clonarrow Wind Farm proposes to connect to the existing Derryiron 110kV Substation in the townland of Clonin Co. Offaly. Clonarrow Wind Farm and Derrynadarragh Wind Farm do not share a common GCR. Therefore, cumulative effects are not expected from the GCR.

It is estimated that during the civil construction phase, the Clonarrow site will generate a peak of 125 HGV trips and 40 LGV trips per day on the public road network. This peak is expected only on four separate days throughout the 16-month construction period, coinciding with concrete pours for the turbine foundations. On all other days, when concrete pouring is not occurring, the development is expected to generate a maximum of 50 HGV trips and 30 LGV trips per day.

The wind farm does not generate any perceptible levels of traffic during operation as it is remotely operated. In the highly unlikely event of a significant turbine component replacement during the Derrynadarragh Wind Farm operational phase, this will involve a small number of HGV trips and potential abnormal load deliveries along the TDR route over a short period of time.

It is considered that no cumulative effect will be created as a result of this development during the operation or decommissioning phases of the Derrynadarragh Wind Farm.

14.10 Conclusion

There are no significant impacts expected on the receiving environment as a result of the construction, operation and decommissioning of the Proposed Development.

The Proposed Development is likely to result in a slight to moderate short-term negative impact on the existing road network during the construction phase if adequate mitigation measures are not implemented.

Following implementation of mitigation measures outlined herein, residual impacts during the construction phase will be reduced and are not expected to exceed ‘slight to moderate’ in significance.

Impacts during operation and decommissioning are considered imperceptible to not significant.

There are no significant cumulative impacts expected on the receiving environment as a result of other existing or proposed projects.

The mitigation measures identified in this Chapter will be adopted and implemented by the Contractor and incorporated into the construction stage CEMP and TMP for the project.

A TMP is contained in Appendix 14.1, Volume III of this EIAR. In the event planning permission is granted for the proposed development, the final TMP will address the requirements of any relevant planning conditions, including any additional mitigation measures which are conditioned.

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