Derrybrien Wind Farm Project

Gort Windfarms Ltd.

Remedial Environmental Impact Assessment Report
Chapter 14-Roads, Traffic & Transport

Document No.: QS-000280-01-R460-001-000

Date: July 2020

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14 Roads, Traffic and Transport

14.1 Introduction

14.1.1 Chapter Scope

This chapter provides an assessment of the impact of Derrybrien Wind Farm Project (the Project) with respect to roads, traffic and transport.

It should be noted that impacts relating to other material assets, e.g. built services, are assessed separately, under Chapter 13 of this rEIAR.

Figures are contained in A4 format as they are referenced within the chapter. Where necessary for clarity these are reproduced at A3 in Appendix 14-C.

14.1.1.1 Assessment Timeframes

Impacts are considered over a range of timeframes which have been broken down for clarity as follows:

Impacts which have occurred: Impacts associated with the construction of the project and its operation to date outlined by Section 14.3.1.

Impacts which are occurring: Ongoing impacts associated with the continued operation of the project outlined by Section 14.3.2.

Impacts which are likely to occur: Potential impacts associated with the operation of the project into the future, and ultimate decommissioning of the project, are also outlined by Section 14.3.2.

14.1.1.2 Assessment Area

Impacts are considered for the three main constituents of the Project as outlined by Chapter 2: the wind farm site and associated discrete ancillary works locations, the grid connection site and associated discrete ancillary works locations together with locations where works were undertaken in response to the peat slide. For the purposes of this chapter the assessment area also includes the surrounding road / transport network including the following:

- Coillte entrance road to Derrybrien Wind Farm from the Black Road.
- Entrance to Agannygal Substation from an unnamed local road; referred to throughout this document as Unnamed Local Road A.
- Local access / haul routes including those used by personnel and those used in the delivery of plant, materials and turbine components.
- Upgrade / repair works locations including roads and bridges.
- The general surrounding traffic and transport network.

Figure 14-1 below illustrates the location of the wind farm generally, including the immediately surrounding transport network and key features of the Project which relate to traffic and transport.

N

Coillte Track:
Primary Wind Farm Access Road

Site Access From Public Road Network

Site Entrance

Coillte & Private Access Location

Derrybrien Wind Farm

Coillte Track: Turbary Access

Black Road

Derrybrien Substation

Derrybrien - Agannygal 110kV Overhead Line

Unnamed Local Road A

Site Access

Site Access From Public Road Network

Agannygal Substation

R380

R353

Inset Map

Galway

Derrybrien Wind Farm Project

Legend

- Derrybrien Wind Farm
- Agannygal Substation
- Derrybrien Substation
- Derrybrien Wind Farm Site Entrance
- Derrybrien - Agannygal 110kV Overhead Line
- Derrybrien Wind Farm Site Access Road
- Derrybrien Wind Farm On site roads
- Site Access Road to Substation

0 1 2 3 4 km

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DRAWING TITLE: **Figure 14.1 - Site Context**

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14.1.2 Statement of Authority

This chapter has been prepared by Claire Whiteway, a Senior Civil Engineer with 10 years' experience.

Claire has an honours degree in Civil Engineering awarded by the National University of Ireland, Galway in 2007 and a Master of Science in Sustainable Energy Systems awarded by Edinburgh University in 2008.

Claire has over 10 years' experience in the area of roads, traffic and transport, project planning, development and environmental impact assessment, including experience on major infrastructure and energy projects.

14.1.3 Methodology

This chapter has been prepared having regard to:

- Transport Infrastructure Ireland's (TII's) Traffic and Transport Assessment (TTA) Guidelines (2014).
- EPA Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (2017).

As noted in subsequent sections (see Section 14.1.4) no traffic data is available for the pre-construction or project construction phases. Accordingly, a Traffic & Transport Assessment (TTA) has not been undertaken and this assessment comprises a qualitative assessment. It is not anticipated that a TTA would alter the findings of this impact assessment.

A conservative approach has been taken for the impact assessment in particular with respect to the durations of some of the civil and electrical works. This conservative assessment has been undertaken with input from members of the construction team who were on site during construction of the works and estimates based on industry experience. The text and tables included in this chapter which set out information relating to vehicle movements, personnel and durations have been prepared with the use of the following sources:

- Construction stage records including, but not limited to, claims documents, meeting minutes, site reports and correspondence.
- Input from ESB personnel who were involved in the delivery of the Project.

14.1.3.1 Categorisation of Impact & Effect

Figure 2.1 of the EPA Draft Guidelines (2017) demonstrates how the identification of impacts leads to effects which should be classified and addressed accordingly.

Table 3.3 of the same EPA Draft Guidelines (2017) provides defined terms for the description of effects. Where relevant, throughout this chapter, effects have been described using these terms as they relate to quality of effect, degree of significance, extent, context, probability, duration and frequency.

Throughout this chapter, following the characterisation of impacts, an assessment of the environmental significance of their effects, as they relate to roads, traffic and transport, is made. As recommended by Section 3 of the TII TTA Guidelines, the assessment identifies both positive and negative impacts. In that regard significance

is a concept related to the weight that should be attached to effects. For the purpose of this assessment 'significant effect' is an effect that either supports or undermines the operation of the roads and transport environment and the traffic experienced in that environment. A significant effect is simply an effect that is sufficiently important to require assessment and reporting so that the decision maker is adequately informed of the environmental consequences of permitting a project.

14.1.3.2 Site Visit

A site visit was undertaken on 5th November 2019 by the author of this chapter. The visit included Derrybrien Wind Farm site, Agannygal Substation, the location of various upgrade works and the surrounding road network.

14.1.4 Difficulties Encountered

In assessing impacts which have occurred, by its nature, this remedial Environmental Impact Assessment Report (rEIAR) is assessing those impacts many years after the project construction. As a result, there may be both undocumented instances of minor impacts which are not captured by this rEIAR in addition to gaps in the historical data available.

Difficulties were encountered in relation to the following:

- Assessing the precise number of vehicles required to transport felled trees off-site during construction and operation of the wind farm. A conservative assessment forms the basis for the impacts outlined by Section 14.3.1 in this regard.
- Identifying the exact materials volumes associated with the construction of the OHL.
- Identifying the exact access locations and routes utilised during the construction of the OHL. The assessment is based on input from members of the construction team and the proposed decommissioning strategy for the OHL which is considered similar in nature to the construction phase.
- Identifying the exact routes for the transportation of abnormal loads, including turbine components, to the wind farm.
- Very minor quantities of materials may have been sourced from locations other than those identified herein. No information on these locations was available beyond hand written records with limited specifics. However, it is not anticipated that their inclusion would alter the impact assessment contained herein.
- Traffic survey data is unavailable for many of the surrounding roads (refer Section 14.1.3). The absence of traffic data and a TTA is not considered necessary for a robust assessment of traffic impacts nor would one be expected to change the outcome of this impact assessment.
- For the cumulative assessments, limited information is available in relation to the extent that other development utilised the road network within the same timeframe as the Project construction and operational phases.

- Difficulties were encountered in sourcing details relating to temporary barrages (A, B, C & D), installed as a result of the peat slide during construction but no longer in place. Information on the size of the barrages, material volumes used and how the barrages were accessed was unavailable. However, the absence of this information is not anticipated to alter the impact assessment herein.
- In the years between the baseline date for the purposes of this rEIAR and present day a number of transport network upgrades have been undertaken in the vicinity of the project. These changes are documented in Section 0 which also includes a description of the significance of the changes on this impact assessment. While major network changes are considered it is acknowledged that minor changes may have also occurred which are not described by this chapter. These changes are not expected to have led / to lead to significant impacts, by the very nature that they are relating to minor network upgrades / modifications.

14.2 Baseline / Receiving Environment

The baseline for assessment of environmental effects represents the position prior to the commencement of development.

The following sections identify some of the key features of the receiving environment surrounding the project in its baseline condition; describing the receiving environment both at that baseline and at present day. Figure 14-1 illustrates the locations of the receiving environment features which are described below.

The Road Safety Authority online database was referred to in order to assess available road safety statistics in the area of the Project. However, no significant history of road collisions is illustrated.

14.2.1 Coillte Track – Primary Wind Farm Access Road

Access to the wind farm site is via an existing Coillte owned forest track, running in an east west direction from Black Road to the eastern end of the wind farm (approximately 3.1 km). The track was used during construction and operation activities to date and is expected to continue to be used for access for both ongoing operation and ultimate decommissioning of the project.

In its baseline condition the Coillte forest track comprised an un-surfaced track typically of 2.9 m width comprising a make-up of crushed limestone and crushed rock material. The image provided by Plate 1 illustrates the track after upgrades which were undertaken as part of the Project. No image could be sourced for the track prior to the upgrades.

Plate 1: Coillte Track to Wind Farm; Northbound (Captured November 2019)

Coillte Track – Primary Wind Farm Access: Traffic Volumes

The track is not a public road and before construction of the Project commenced was used primarily by Coillte staff in relation to the management of the forestry in the area. It is assumed that traffic volumes were low and did not include general public usage.

14.2.2 Coillte Track – Turbary Lands Access Road

An existing Coillte owned track running in an east west direction from Black Road at its eastern end is also illustrated by Figure 14-1. This track provides access to turbary lands located in the vicinity of the wind farm. The track was upgraded during construction of the project and provided access for some haulage during construction in addition to access for turbary land users.

The road is typically less than 3 m in width. The image provided by Plate 2 illustrates the track prior to upgrades which were undertaken as part of the wind farm project while Plate 3 illustrates the track in November 2019.

Plate 2: Coillte Track to Turbary Lands; Eastbound (Captured September 2003)

Plate 3: Coillte Track to Turbary Lands; Eastbound (Captured November 2019)

Coillte Track – Turbary Lands Access: Traffic Volumes

This Coillte track is also not a public road and again, before construction of the Project, the track was used primarily by Coillte staff or turbary rights land users. It is assumed that traffic volumes were low and did not include general public usage, other than the access to turbary plots.

14.2.3 Black Road

Black Road provides the main access route to the wind farm on the public road network. The road generally runs in a north south direction between the R353 at its southern end and Killeenadeema village (south of Loughrea) at its northern end. During construction it formed a link on the haulage route for the project.

In its baseline condition Black Road comprised a narrow, surfaced road, with verges and access gates along its length used for two-way vehicle passing. It was, and remains, a two-way unmarked road. No posted speed limit was observed during the site visit. Plate 4 is an image of Black Road circa. August 2003 and Plate 5 illustrates Black Road in November 2019.

Plate 4: Black Road circa. August 2003

Plate 5: Black Road; Northbound (Captured November 2019)

Black Road: Traffic Volumes

Black Road comprises a road on the public network. It is primarily used for local access however the area surrounding Black Road is primarily rural with very little housing / development. There are no permanent traffic counters on the road and no traffic surveys were undertaken for the Project. As witnessed during the site visit and over both the construction and operational periods for the wind farm, traffic volumes were observed to be very low on the road.

14.2.4 R353 Regional Road

The R353 regional road also formed a link on the haulage route during construction of the Project. The road generally runs in an east west direction between Gort (western end) and its intersection with the R352 (eastern end), just west of Portumna. Along its length the R353 passes through Derrybrien village.

In its baseline condition the R353 comprised a two-lane two-way surfaced road with line markings. No posted speed limit was observed during site visits. Plate 6 illustrates the R353 at its intersection with Black Road.

Plate 6: R353; Westbound (Captured November 2019)

R353: Traffic Volumes

The R353 comprises a road on the public network. It provides the main access between Gort and Portumna. As witnessed during the site visit and over both the construction and operational periods for the wind farm traffic volumes were observed to be low on the R353, albeit volumes are higher than those experienced on local roads including Black Road.

14.2.5 R476 Regional Road

The R476 regional road also formed a link on the haulage route during construction of the Project. The road generally runs in a north south direction between the N85 (southern end) and Lisdoonvarna (northern end). The R476 was used during haulage as far as Corofin village, where it intersected the R460, during the construction of the Project.

In its baseline condition the R476 comprised a one-lane two-way surfaced road with line markings in a rural environment. Plate 7 illustrates the R476 in the northbound direction, south of Corofin.

Plate 7: R476; Northbound (Image from Google Maps Sourced February 2020)

R476: Traffic Volumes

The R476 comprises a road on the public network. It provides the main access between Ennis and Corofin / The Burren.

14.2.6 R460 Regional Road

The R460 regional road also formed a link on the haulage route during construction of the Project. The road generally runs in a south west to north east direction between the R474 at Miltown Malbay (western end) and Gort (eastern end). The R460 was used during haulage from Corofin village, where it intersected the R476, towards Gort, during the construction of the Project.

In its baseline condition the R460 comprised a one-lane two-way surfaced road with line markings in a rural environment. Plate 8 illustrates the R460 in the westbound direction, west of Gort.

Plate 8: R460; Westbound (Image from Google Maps Sourced February 2020)

R460: Traffic Volumes

The R460 comprises a road on the public network. It provides the main access between west Co. Clare and Gort. Traffic volumes are observed to be low on this road.

14.2.7 N18 National Primary Road (Now R458)

The N18 national primary road also formed a link on the haulage route during construction of the project. The N18 formed part of the national road network managed by the National Roads Authority (NRA) during the baseline period and throughout construction of the project. After the construction of the M18 motorway, described by Section 14.2.8, the N18 was downgraded to the R458 (regional road) and is since under the management of Galway County Council (GCC).

All construction delivery traffic for the project arrived at the local road network via the N18 national primary road although it should be noted that personnel movements may have travelled from the Loughrea direction on the Black Road.

The N18 (now R458) is located to the west of the wind farm and generally runs in a south west to north east direction between Gort (southern end) and Loughrea (northern end). In its baseline condition the N18 comprised a two-lane two-way surfaced road with line markings. The image provided by Plate 9 illustrates the R458 as it is at present day.

Plate 9: N18 (now R458); Southbound (Image from Google Maps Sourced November 2019)

N18: Traffic Volumes

During the baseline and construction of the Project the N18 comprised a national road on the public network managed by the NRA. During construction it formed part of the main access road between Galway and Limerick and a link on the haul route for the project.

NRA traffic data from 2003 is available online at:

(https://web.nra.ie/TrafficCounterData/html/N18-06.htm)

Data for the years between 2003 and 2006 inclusive is provided in Table 14-1 below for a traffic counter location on the N18, 6 km south of Gort.

Table 14-1 NRA Gort N18-06 Traffic Data

Data	2003	2004	2005	2006
AADT	9009	9408	10258	10856
% HGV	9.8%	9.7%	10.6%	9.6%
Coverage	364 days	364 days	343 days	126 days

14.2.7.1 Upgrades to the N18

Between January 2015 and September 2017 construction of the M18 motorway took place between Oranmore and Gort as part of the overall Gort to Tuam scheme. This resulted in the N18 being retained as the R458 regional road while the newly constructed M18 became the primary route between Galway and Limerick.

In that period the NRA was also replaced by TII, the present-day authority for the national roads network, which includes the M18.

The M18 now serves as the primary road from which access is and will be taken, onto the national, regional and local road network, for the ongoing operation of the wind farm and its ultimate decommissioning.

For the purposes of this rEIAR:

- The N18, prior to the undertaking of the M18 construction, is considered for the impact assessment documented by Section 14.3.1; impacts which have occurred.
- The M18 is considered for the impact assessment documented by Section 14.3.2; impacts which are likely to occur.

14.2.8 M18 Motorway

The M18 motorway, managed by TII, serves as the nearest major road from which traffic related to the ongoing and future operation of the wind farm, and its ultimate decommissioning, will travel before / after connecting to the national, regional and local roads immediately surrounding the project.

The M18 is located to the west of the wind farm and generally runs in a north – south direction connecting to the M17 and M6, east of Galway, at its northern end and the N18 and N19, south east of Ennis, at its southern end.

The M18 comprises a four-lane two-way motorway. It has a speed limit of 120 km / hr. The image provided by Plate 10 illustrates the M18 in present day.

Plate 10: M18; Southbound (Image from Google Earth Sourced November 2019)

M18: Traffic Volumes

The M18 comprises a national road on the public network. TII has a permanent traffic counter (reference TMU N18 024.0 N) between Ardrahan / Kilcolgan and Gort with summary data per Table 14-2 below.

Table 14-2 TII TMU N18 024.0 N Traffic Data

Data	2017	2018	2019
AADT	11064	12476	13928
% HGV	5.4%	5.4%	2.5%
Coverage	24.4%	99.7%	82%

Provided for clarity Figure 14-2 below highlights the N18 alignment (baseline condition) in addition to the M18 alignment (present day).

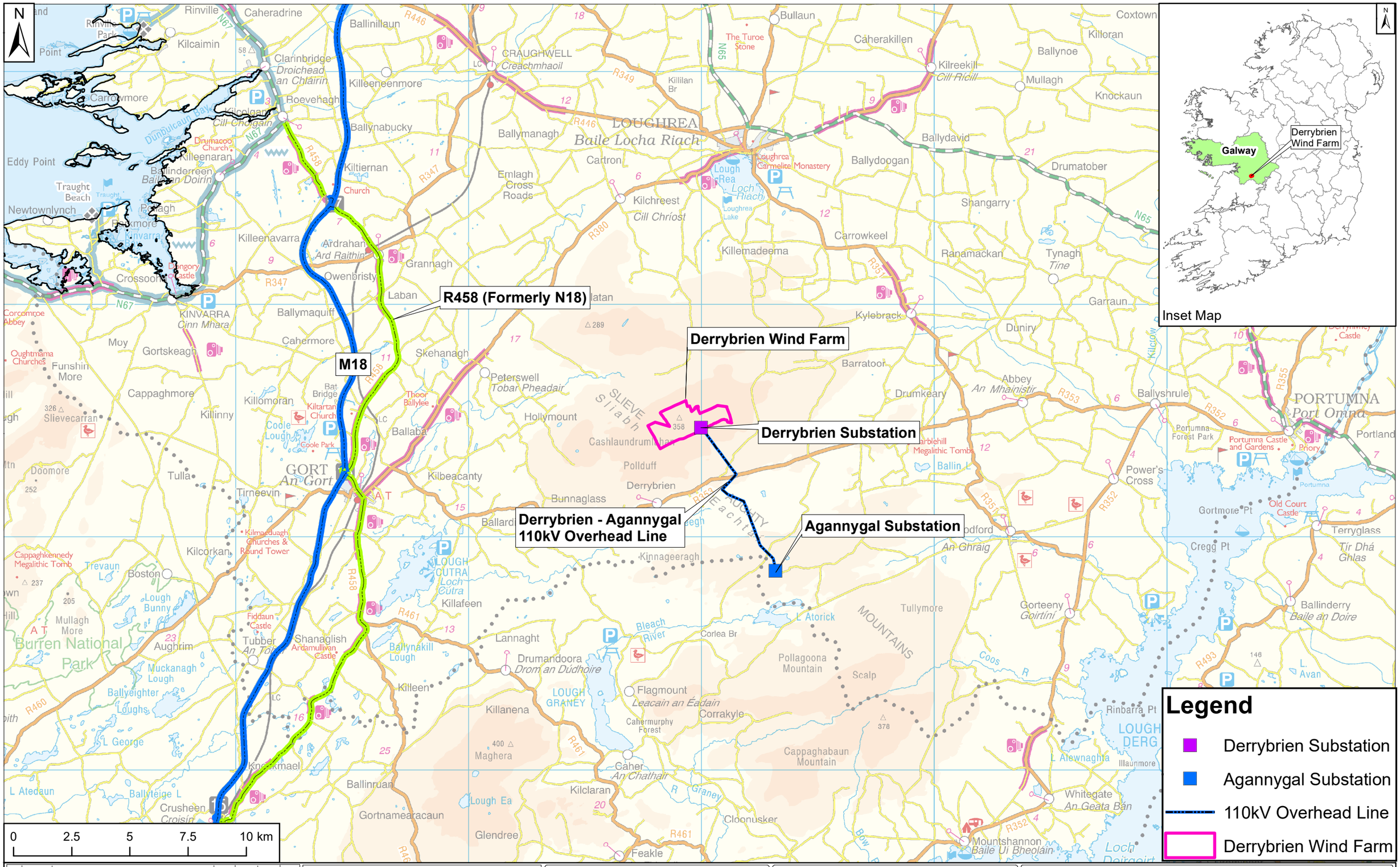

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Figure 14.2 - N18 & M18 Alignment

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14.2.9 Unnamed Local Road A

Agannygal Substation is located to the north of Unnamed Local Road A, as illustrated by Figure 14-1. While access to the substation is from this road only a short section of the road is used by vehicles associated with the project with an existing Coillte track providing the majority of the access route to the substation, as outlined by Section 14.2.10. The local road generally runs in an east west direction connecting to other local roads; in County Clare at its western end and in County Galway at its eastern end.

The road is a narrow, two-way, unsealed, unmarked road as illustrated by Plate 11. No posted speed limit was observed during the site visit.

Plate 11: Unnamed Local Road A (Image from Google Maps Sourced November 2019)

Unnamed Local Road A: Traffic Volumes

This public road provides local access only. While no traffic survey data is available, based on observations during the site visit it was discerned that this road experiences extremely low volumes of traffic.

14.2.10 Coillte Track – Agannygal Substation Access

The site of the Agannygal Substation was primarily accessed during construction via a Coillte access track. This track was upgraded as part of the overall project to provide this access. The track generally runs in a north-west to south-east direction connecting to minor local roads at both western and eastern ends.

The track comprises a narrow, two-way, unsealed, unmarked road as illustrated by Plate 12.

Plate 12: Coillte Track to Substation (Image from Google Maps Sourced November 2019)

Coillte Track – Agannygal Substation Access: Traffic Volumes

The track does not comprise a road on the public network and before the project construction it was, and continues to be, used solely by Coillte staff in relation to the management of the forestry in the area in addition to ESB Networks staff in relation to ongoing substation maintenance. While no traffic survey data is available, based on observations during the site visit it is considered that this track experiences extremely low volumes of traffic; only those relating to Coillte staff usage.

14.3 Impact of the Development

14.3.1 Impacts which have Occurred

This section outlines the impacts of the project which have occurred between the baseline of 1998 and April 2020. Impacts are assessed in three phases.

14.3.1.1 Construction – Circa June 2003 – March 2006

This section identifies the impacts which occurred during the construction of the project between circa June 2003 and March 2006, excluding activities relating to the offsite works associated with the peat slide which are dealt with by Section 14.3.1.2.

Traffic and transport impacts during this period were associated with the following aspects of the Project:

- General project requirements;
- Site preparation works;
- Civil works;
- Electrical works; and
- Wind turbines.

Timeframes for each of the above project phases are generally outlined by Table 14-A included in Appendix 14-A.

General Project Requirements

Personnel Movements

Table 14-3 identifies the number of construction personnel who attended the project site during the overall construction period. The number of personnel below represents peak conditions and during many periods, personnel numbers would have been lower than those shown below.

Table 14-3 Construction Personnel – General

Phase & Personnel	Peak Personnel Numbers
All construction phases – Gort Windfarms Ltd. and agents	Approximately 4 – 10
Coillte tree felling	Up to 10
Civil works contractors	Up to 60
Electrical works contractors	Up to 30
Wind turbine supply & installation	Up to 50

Personnel movements were fairly evenly distributed across the Project duration of 34 months. As tree felling and civil works' personnel numbers reduced on site, numbers increased in relation to electrical and wind turbine works.

Most construction workers arrived at the project site compound, OHL works' locations or Agannygal substation in private / developer vehicles during construction. There was no readily available public transport to serve the project site given its rural location. Personnel arriving to site used both the haul routes as identified by Figure 14-3 and the Black Road from the Loughrea direction.

Assuming a vehicle occupancy rate of 1.25 for the peak scenario (i.e. when the highest personnel numbers were present on the project; 160 in total from Table 14-3) equates to approximately 128 vehicles arriving to and departing from the project site each working day; resulting in maximum total daily movements of 256 on the local network. This represents a maximum, conservative scenario and in reality, numbers experienced would be lower; typically, in the order of 72 vehicles approaching site per day or 144 movements.

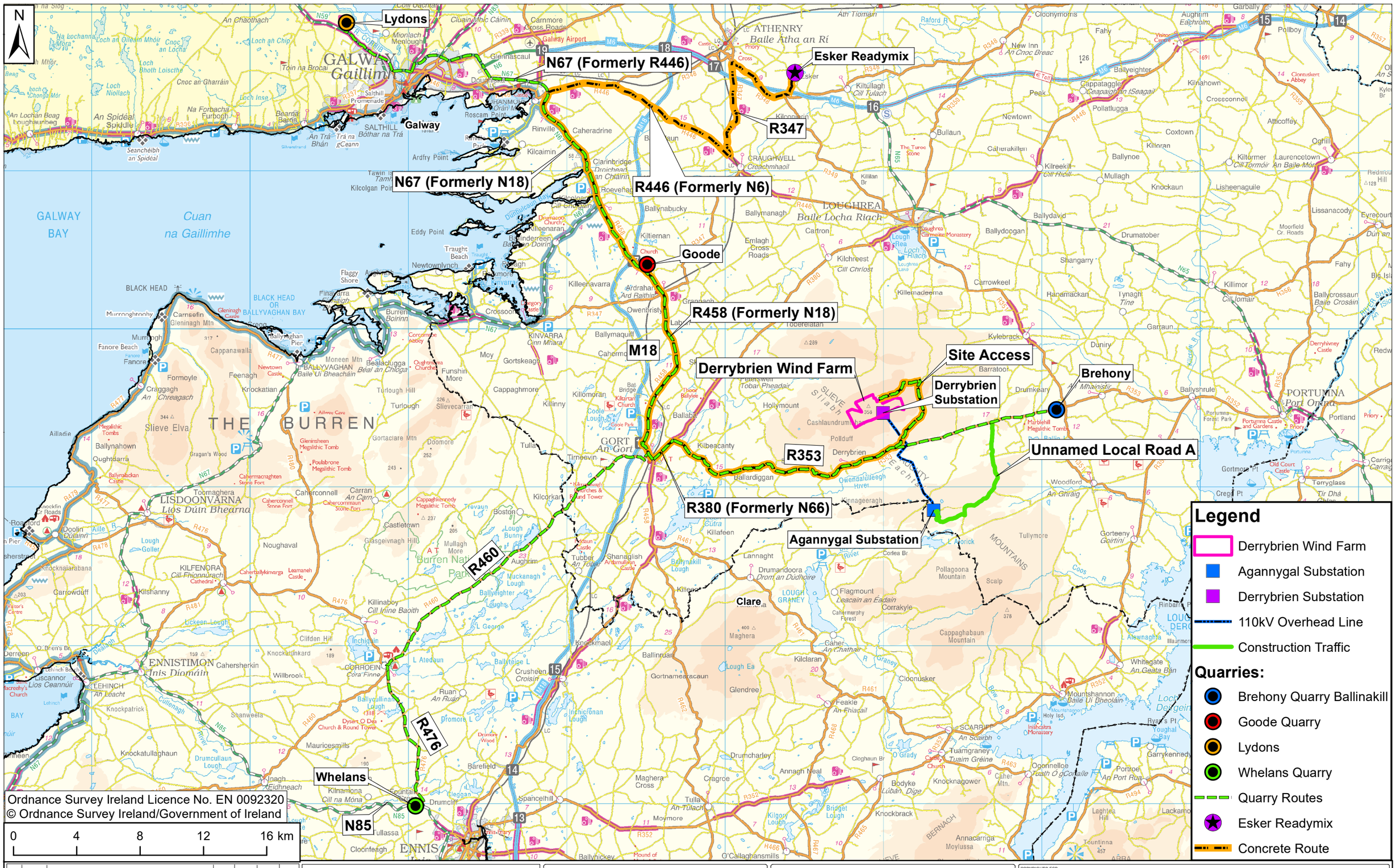
The N18 experienced average daily flows as follows (2003 volumes, refer NRA historical counter data at:

Error! Hyperlink reference not valid.https://web.nra.ie/TrafficCounterData/html/N18-06.htm):

- 4509 northbound vehicles; and
- 4502 southbound vehicles.

An additional volume of approximately 128 vehicles (i.e. approximately 2.8% of one-way daily traffic movements) in the peak construction scenario is unlikely to have resulted in a significant impact on the N18, due to the high existing traffic levels experienced on this national road.

However, impacts on Black Road and the surrounding local road network would have differed given the low baseline levels which existed on those roads during construction. The baseline condition on local roads consisted of much lower levels of traffic, whereby additional traffic volumes would have had a more significant impact on road users however they are considered to have resulted in **short-term, negative, moderate effects**.



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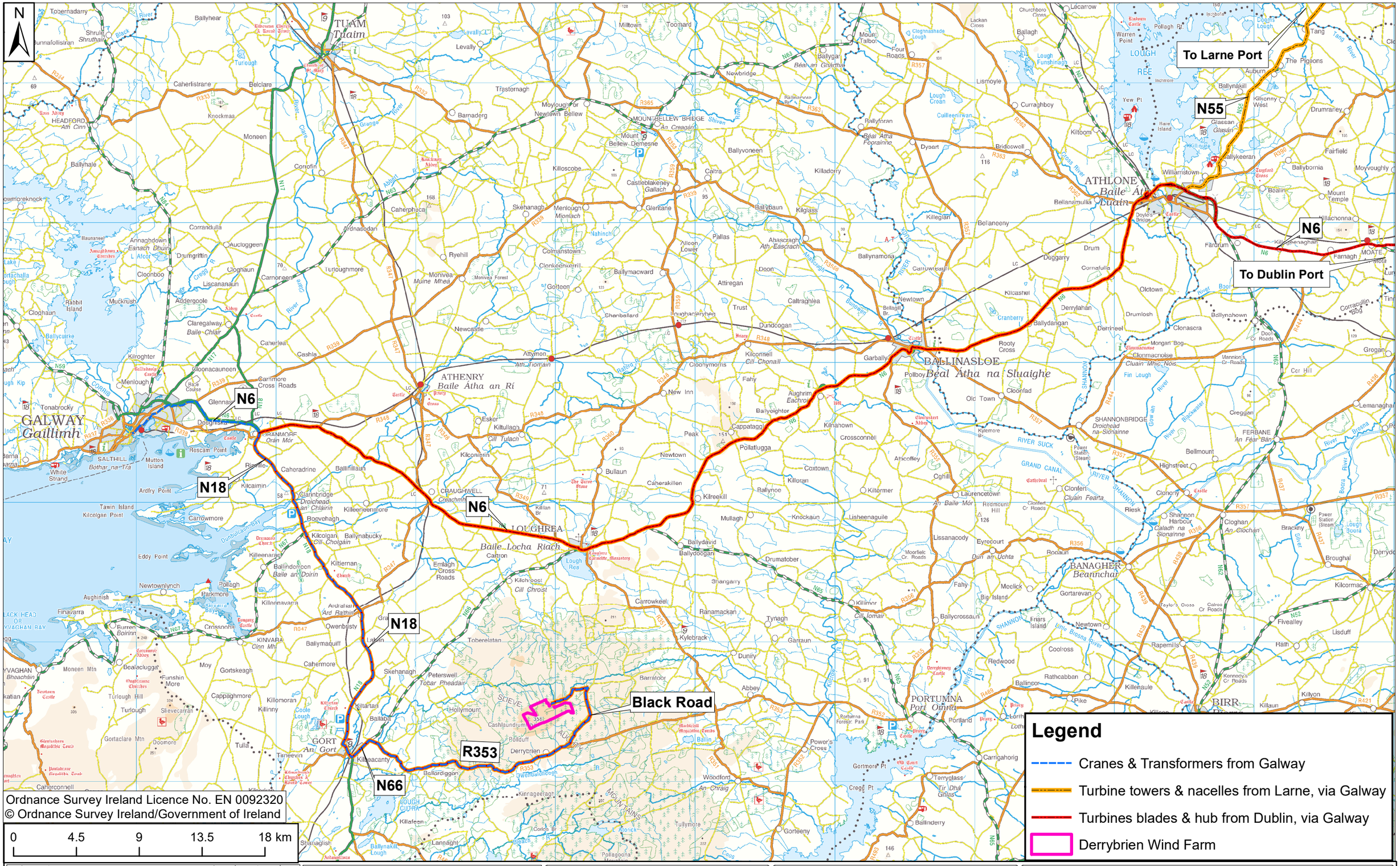

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Figure 14.4 - Haul Routes - Turbines

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Plant Movements

Table 14-4 below identifies the key plant which were utilised during construction.

Table 14-4 Typical Plant – Civil & Electrical

Plant	Plant (Cont'd)
Harvesters	Flatbed Trailer
Forwarders	JCB
Timber Lorries	3-axle HGV's
Excavators (10 tonne to 50 tonne) incl. 360 excavators	4-axle HGV's
Crusher	Personnel 4WD vehicles
Front Loader	Lighting Generator
Dumper	Mobile Pump
Dozer	Air Compressor
Roller	Mobile Concrete Pump (intermittent only)
Tractor & Bowser	Mobile Crane (intermittent only)
Rotary Core	

All of the above plant was transported to the site on the haul routes illustrated by Figure 14-3. Movements associated with the delivery of plant to the site were low and typically involved a single trip to site and a single trip away from site with the exception of timber hauliers. As a result, movements of plant equipment are considered unlikely to have had a significant impact on any of the haul routes identified. Movements of plant would have been concentrated at the start and end of construction activities.

Material & Equipment Imports

Table 14-5 identifies the material and equipment imports to the Project and their sources while the haul routes used for deliveries, including abnormal loads associated primarily with the turbines, are illustrated by Figure 14-3 and Figure 14-4.

It should be noted that much of the rock material required by the project was sourced at onsite borrow pits with internal vehicle movements only, thereby minimising the impacts associated with rock material import.

Movements of HGV's were spread across the 34-month construction period. The following summarises the maximum daily movements at peak periods during the project calculated using the information in Table 14-5:

- Peak HGV movements occurred in July 2005; although it should be noted that only slightly smaller peaks also occurred in August – September 2003, and over the longer period of July 2004 – September 2005. Assuming a single month duration the following occurred:
    - Maximum average daily deliveries of approximately 15 (rounded up) HGV's.
    - Maximum daily movements of approximately 30 (rounded up) HGV's.
    - Approximately 1.2 HGV's per hour (2.5 HGV 2-way movements) during the maximum peak period for HGV deliveries.

Abnormal load deliveries were spread across a 6-month period. Both in order to minimise impact to the local network and for safety reasons the majority of movements took place outside of peak periods, overnight, along the majority of the route. Once abnormal loads reached Derrybrien Village on the R353 they were parked until the hours of daylight at which point, they then travelled to site via the R353 and Black Road.

The following summarises the maximum daily movements at peak periods during the project calculated using the information in Table 14-5:

- Peak abnormal movements occurred between April and September 2005.
    - Maximum average daily deliveries of approximately 3 (rounded up) abnormal loads.
    - Maximum daily movements of approximately 5 (rounded up) abnormal vehicles.

The above maximum values are conservative estimates based on the information available at the time of writing and are subject to the difficulties identified by Section 14.1.4. The actual daily volumes would be expected to be lower.

During peak HGV deliveries impacts are expected to have resulted in **short-term, negative, moderate impacts** on the immediately surrounding local road network. During abnormal deliveries impacts are expected to have resulted in **short-term, negative, moderate impacts** on the immediately surrounding local road network.

There were isolated occurrences of disruption as a result of incidents during the transportation of abnormal loads. Specifically, as a result of an incident in June 2005 a blade transport trailer blocked Black Road for a brief duration during which diversions were in place. While this would have led to a temporary significant impact no significant effects are deemed to have occurred due to an isolated disruption of this type.

Table 14-5 Total Material Movements – Civil & Electrical (including wind farm, OHL, substation components)

Materials	Source	Approximate No. of Deliveries	Approximate Dates	Approximate Duration
Tree Felling – **moved off-site by trailers**	- Wind farm site, OHL & Agannygal substation	6690	May 2003 – Sep 2005	Approx. 29 months
Rock & Crushed Stone	- Brehony Quarry (Ballinakill) - Goode Quarry (Ardrahan) - Whelan's Quarry (Ennis)	<400	June – Sep 2003 & July 2004 – Sep 2005	Approx. 19 months
Concrete	- Goode Quarry (Ardrahan) - Whelan's Quarry (Ennis) - Esker Readymix (Galway)	1000	Aug – Sep 2003 & July 2004 – Sep 2005	Approx. 17 months
Steel	- Lydons of Galway	40	Aug – Sep 2003 & July 2004 – Sep 2005	Approx. 17 months
General Civil Materials	- Assumed to be from Galway direction via N18	35	Between June – Sep 2003 & July 2004 – Dec 2005	Approx. 23 months
Unit Transformers		14	April 2005 – Aug 2005	Approx. 5 months
Electrical Switchgear & General Electrical / Grid		34	Between July 2005 – August 2005	< 1 month
Cabling		7	April 2005 – May 2005	Approx. 2 months
Approximate Total HGV's (incl. trailers for tree felling)		**8220**		

Materials	Source	Approximate No. of Deliveries	Approximate Dates	Approximate Duration
Approximate Total HGV Movements		**16440**		
Derrybrien Substation Transformer	- Assumed to be from Galway direction via N18	1	May 2005	< 1 month
Turbine Towers	- Larne Port - Assumed to be from Galway direction via N18	140	April 2005 – Sep 2005	Approx. 6 months
Nacelle		70		
Generator / Hub	- Dublin Port - Assumed to be from Galway direction via N18	70		
Turbine Blades	- Dublin Port - Assumed to be from Galway direction via N18	140		
Crane Deliveries	Assumed to be from Galway direction via N18	6	Assumed April 2005	Approx. < 1 month
Approximate Total Abnormal Loads		**427**		
Approximate Total Vehicle Movements		**714**		

Site Preparation Works

Tree Felling

During construction of the Project, excluding works associated with the peat slide, approximately 222 ha of tree felling took place within the main wind farm site, along the route of the OHL and at the Agannygal Substation site.

As described by Chapter 2 much of the felled trees were left in-situ or reused on site during construction. Information on the number of trailers which were used in the removal of trees could not be sourced for this assessment. However, a conservative assessment has been undertaken in order to estimate the numbers in Table 14-5 for this activity. This assessment has identified approximately 10 trailers removed felled trees off-site, per day.

Impacts associated with the removal of felled trees from site are captured by the overall HGV movements described earlier in this section.

Civil Works

Roads at Wind Farm Site & Agannygal Substation Site

Existing roads / tracks were upgraded, and new roads were constructed within the wind farm site, over the course of construction, as outlined by Chapter 2. In addition, a new section of road was also constructed from Unnamed Local Road A to Agannygal Substation, on Coillte lands, as part of the project. These works primarily took place between June 2003 and September 2003 and did not impact significantly on public road, traffic or transport. Materials associated with these works were typically sourced from on-site borrow pits with any impacts associated with imported materials considered previously in this section.

Ancillary Works – Roads

The following roads were upgraded off-site on the public road network:

- Localised road widening at Crooked Bridge on the R353.
- Approximately 5.1 km of public road upgrades comprising the following:
    - 5 km of road upgrade works to Black Road involving the widening of the road to provide a minimum effective width of 4 m on straights and 4.5 m on bends.
    - 0.08 km of road upgrade works to the Unnamed Local Road A public road which formed the haul route to Agannygal Substation.
- The bellmouth at the intersection of the Black Road and the Coillte track providing access to the wind farm was widened.

The above locations are illustrated by Figure 14-5.

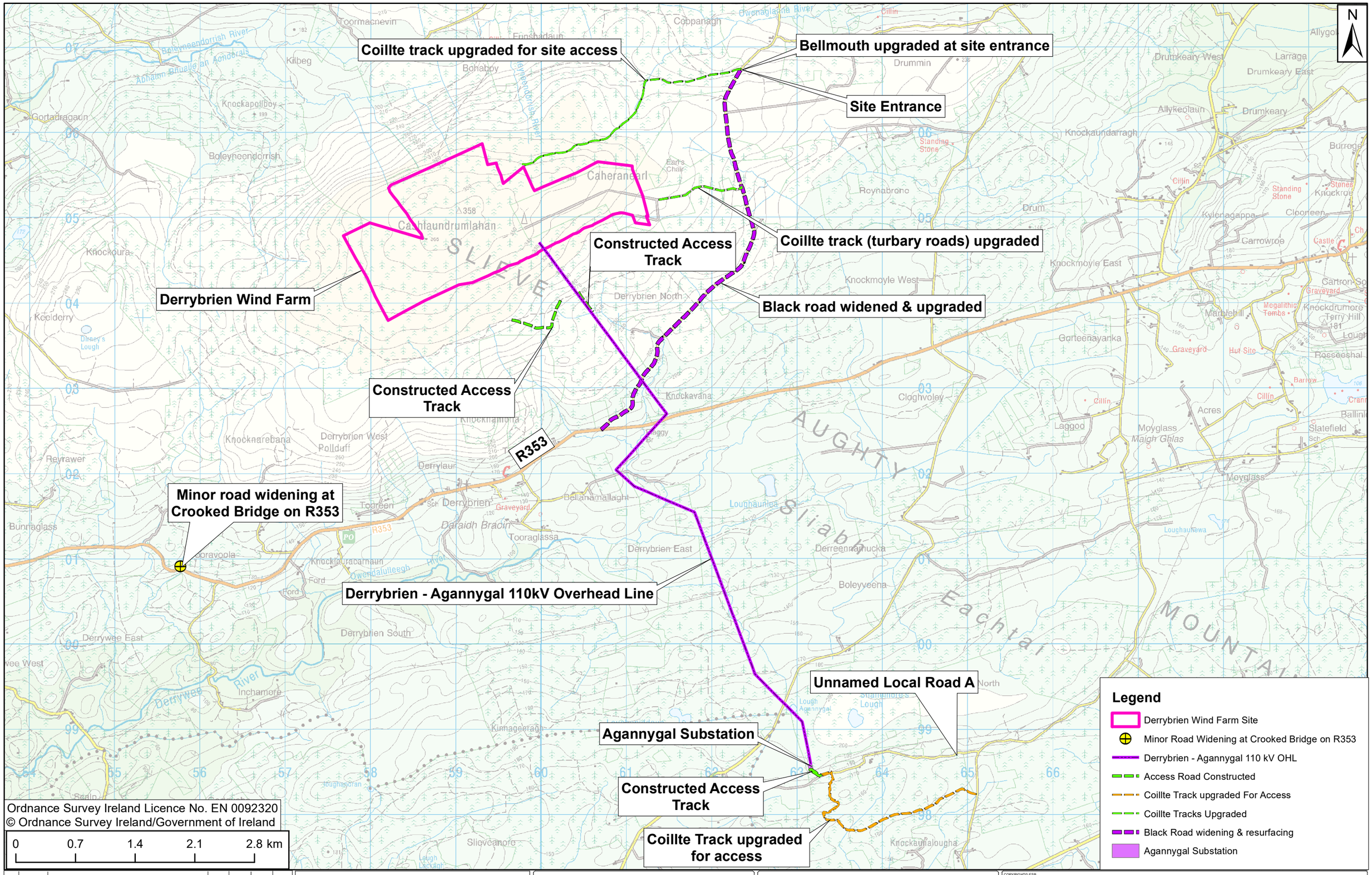
Widening works at Crooked Bridge on the R353 involved the excavation and removal of small amounts of material over a length of approximately 60 m with an average width of 3 m. Subsequently, the materials removed were replaced with hardcore and double surface dressing. Works were undertaken in order to accommodate the transportation of oversize loads to the project site. A conservative estimate is that

works are likely to have been of a maximum duration of less than 1 month. Impacts are unlikely to have been significant in relation to these works.

Black Road upgrade works included widening the road within existing roadside boundaries, strengthening of the existing road, the construction of lay-bys and remedial works to sections of the existing road. These works were undertaken intermittently over the course of the construction phase of the Project. Traffic management measures were agreed with GCC in relation to the works. Impacts to the public during the upgrading of Black Road were **temporary, negative and moderate**.

Upgrade works to Unnamed Local Road A involved resurfacing works to approximately 80 m of the existing road. A conservative estimate is that works are likely to have been of a duration of less than maximum 1 month. Impacts are unlikely to have been significant in relation to these works and are considered **temporary, negative and slight**.

In addition to the works to Black Road itself the bellmouth at the entrance to the wind farm (intersection of Black Road and Coillte Track) was also upgraded including widening and hedge trimming. A conservative estimate is that works are likely to have been of a maximum duration of less than 1 month. Impacts are unlikely to have been significant in relation to these works. Users of the access road include Coillte personnel and Project staff and disruptions during these works did not generally affect members of the public; impacts are considered **not significant**.



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PROJECT: Derrybrien Wind Farm Project

DRAWING TITLE: Figure 14.5 - Road Upgrades

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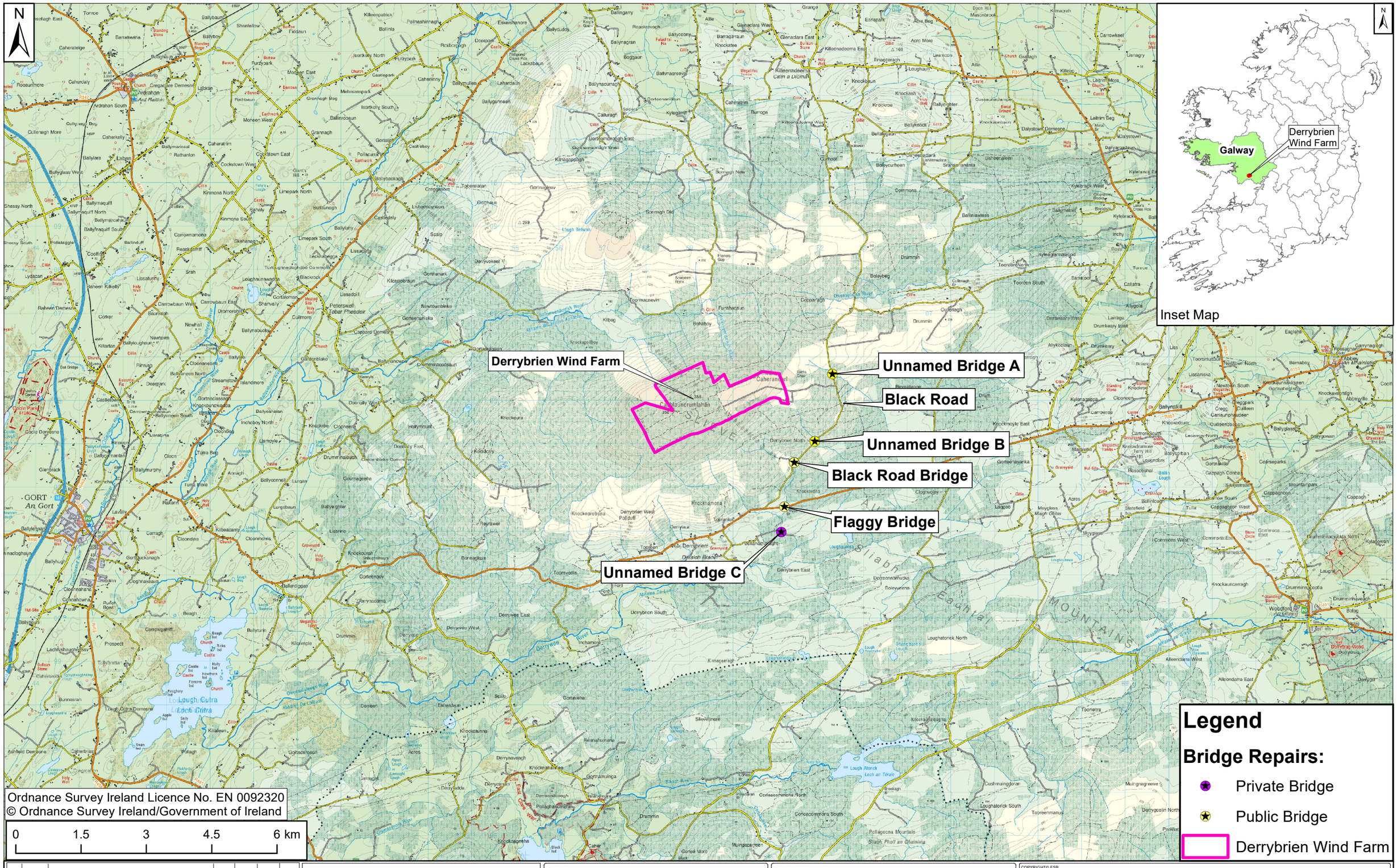
Ancillary Works – Bridges

In order to facilitate the project, works were undertaken to the following three bridges on Black Road involving strengthening of the bridges and surfacing works for an effective width of 4 m and the replacement of the bridge parapets:

- Bridge at 562240.1, 705630.7 (ITM) (Unnamed Bridge A);
- Bridge at 561836.7, 704082.8 (ITM) (Unnamed Bridge B); and
- Bridge at 561367.3, 703601.7 (ITM) (Black Road Bridge).

The location of the bridge upgrade works is illustrated by Figure 14-6.

During the upgrade works to the above bridges local access was largely maintained with traffic management in place. For short durations (less than 2 hours) during critical periods a temporary diversion was in place however local access was retained, with delays, as requested by road users. Works are understood to have taken place over short durations. Local road users are likely to have experienced **temporary, slight, negative impacts** as a result of these upgrade works.



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Turbine Foundations & Hardstands

Materials deliveries associated with the construction of the turbine foundations and hardstands are included in Table 14-5 while peak movements associated with these deliveries, and resulting impacts, have been outlined previously in this section.

Agannygal & Derrybrien Substation Foundation, & OHL Foundations

Similarly, materials associated with the construction of the substation foundations and foundations for OHL angle masts are also included in Table 14-5 while peak movements associated with these deliveries, and resulting impacts, have been outlined previously in this section.

Electrical Works

Grid Connection

On-site electrical works included the following:

- Construction of new Derrybrien Substation within wind farm site boundary.

Off-site electrical works included the following:

- Construction of new Agannygal Substation.
- Construction of OHL between Derrybrien Substation and Agannygal Substation including tie in works to the existing 110kV Ennis – Shannonbridge OHL.

Impacts associated with the construction of the Derrybrien Substation and foundations for OHL angle masts have been captured previously as they relate to personnel, plant and material movements.

In addition, during the construction of the OHL and Agannygal Substation there were impacts associated with increased traffic movements for personnel, the import of materials along the route of the OHL and the export of felled trees in order to clear the route of the OHL. Again, these impacts have been captured previously in this section where they relate to personnel movements, plant movements and materials import.

Difficulties were encountered in finding information on the access locations used from the public road network for the construction of these works. Figure 14-7 and Figure 14-8 illustrate the access locations identified for the decommissioning of the OHL and it is assumed, for the purposes of this assessment, that those same locations were used during construction.

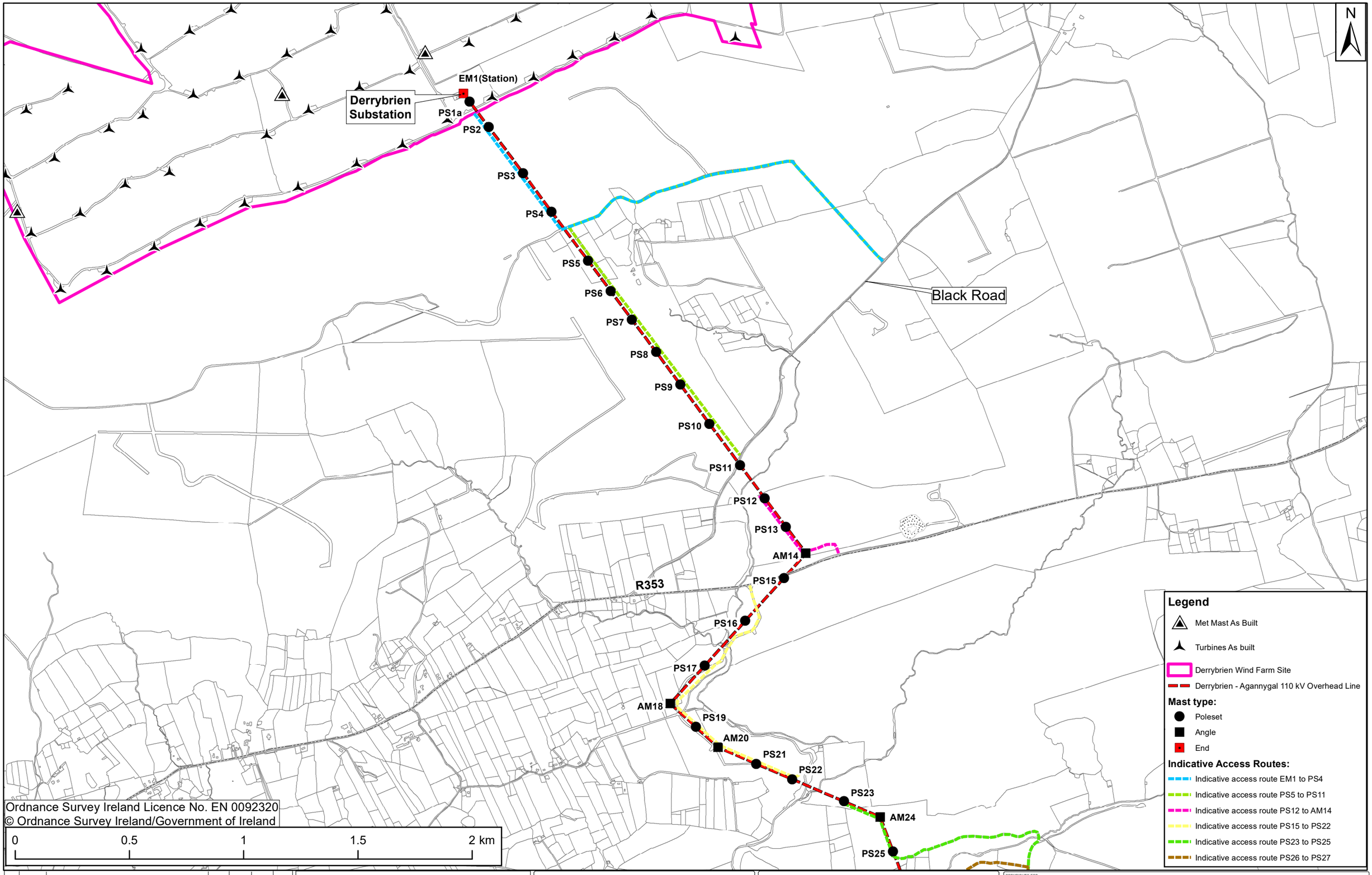

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Figure 14.7 - Derrybrien - Agannygal 110kV Overhead Line - Indicative Decommissioning Access Routes (Sheet 1 of 2)

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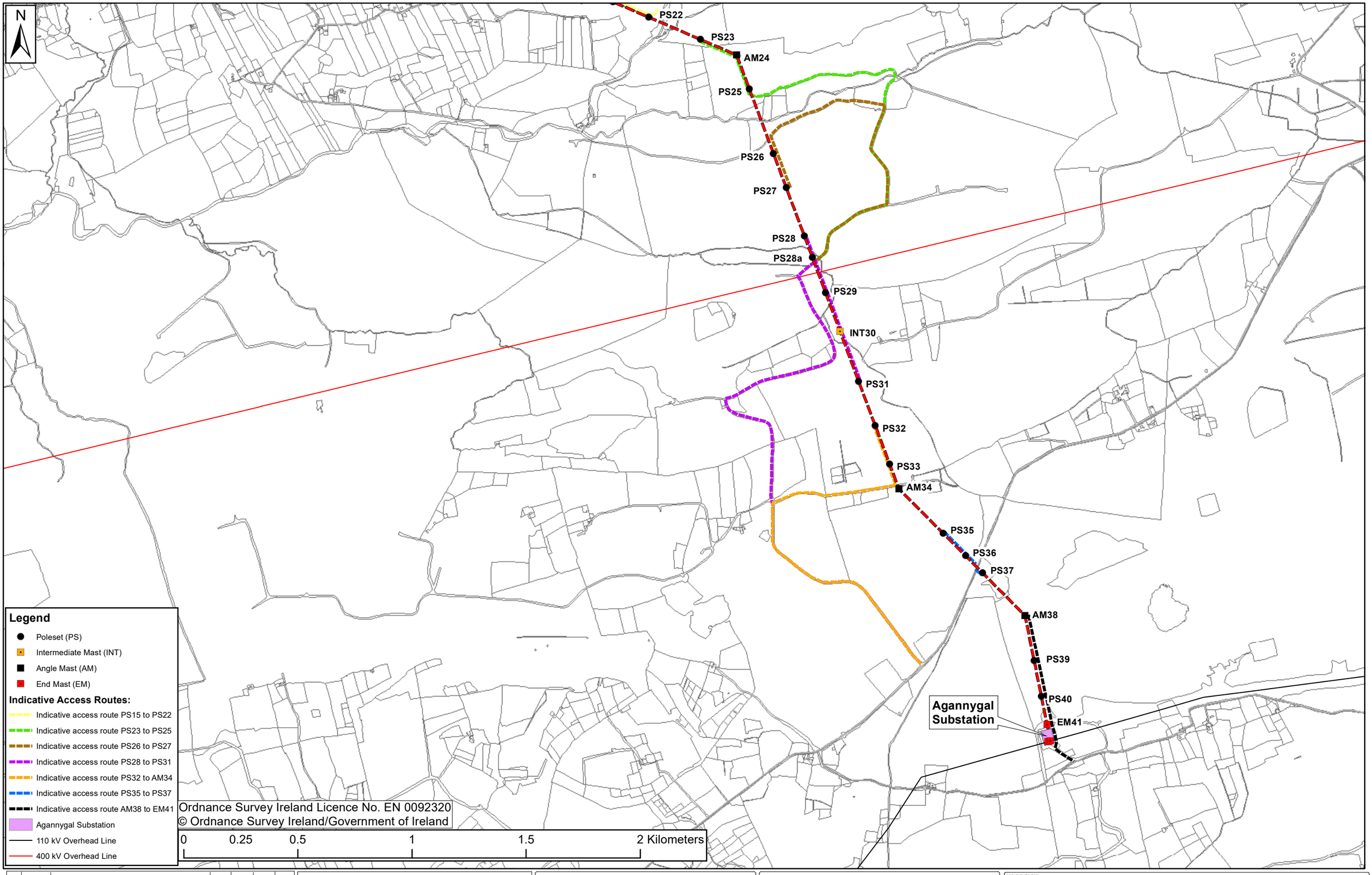

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Figure 14.8 - Derrybrien - Agannygal OHL - Indicative Decommissioning Access Routes (Sheet 2 of 2)

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14.3.1.1.1 Summary of Construction Impacts

In summary, during project construction, both slight and moderate, negative impacts were experienced due to a number of activities on the surrounding roads, traffic and transport network. When considering these various moderate impacts cumulatively, in particular those associated with material movements and public road works, effects are considered to be as follows:

- **During peak construction stages, where maximum vehicle movements were experienced, short-term, significant, negative effects were experienced by users of the local network in the immediate vicinity of the Project.**
- **Beyond the local network, short-term, imperceptible, negative effects were experienced by users of the national network.**

14.3.1.2 Offsite Peat Slide Works: Oct 2003 – end 2005

As detailed in Chapter 2 of this rEIAR construction works halted on 16th October 2003 when a peat slide occurred. Following the peat slide project resources were redirected in response to the slide. This section identifies the impacts which occurred during the response to the peat slide, between circa October 2003 and the end of 2005.

Traffic and transport impacts during this period were associated with the following:

- Temporary closure of local and regional roads during the response to the peat slide.
- Movement of materials between on-site and off-site borrow pits / quarries to the location of barrages and the construction of barrages.
- New access track (approximately 293 m long) to Barrage No. 2.
- Replacement of existing track adjacent Barrage No. 1 (approximately 830 m long).
- Repairs to Black Road Bridge and Flaggy Bridge, both located on public roads.
- Tree felling at repositories.
- Bridge repairs on private land.

Timeframes for works undertaken in response to the peat slide are outlined by Chapter 2 of this rEIAR.

Figure 14-9 illustrates details / features referred to by the impact assessment as documented by this section.

N

Derrybrien Wind Farm

Constructed Access Track

Peat Repository Area at Barrage 2

Barrage 1

Barrage 2

Peat Repository Area at Black Road Bridge

Barrage A

Barrage B

Constructed Access Track

Derrybrien - Agannygal 110kV Overhead Line

Peat Repository Area at Barrage 3

Barrage 3

Barrage 4

R353

Barrage C

Barrage D

Legend

- New Access Track Constructed
- Temporary Barrages (no longer in place) (approximate locations)
- Barrages
- Peat Repository
- Derrybrien Wind Farm Site
- Slip Area
- Derrybrien - Agannygal 110kV Overhead Line

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Figure 14.9 - Roads used (and tracks built) to undertake the response to peat slip works

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Temporary Road Closures

As a result of overtopping at both Black Road Bridge and the Flaggy Bridge on the R353 there were temporary road closures on both the Black Road and the R353 regional road while materials were removed from road surfaces.

The durations of these closures were approximately < 2 weeks on the R353 and approximately 1 month on the Black Road, during which time diversions were in place. Impacts are considered to have been **temporary, negative and significant** in relation to these works.

Movement of Materials & Personnel

In response to the peat slide, construction workers who were previously located at the main wind farm site were mobilised instead to the various works locations illustrated on Figure 14-9. Movements were via the local road network and Black Road, similar to those during construction up to October 2003. As a result, there was no significant change in impact associated with the mobilisation of materials and plant to the location of peat slide response works rather than the main Project works.

In addition to Project personnel small numbers of other personnel, including staff from GCC, assisted in the response works through both the provision of plant and personnel and the management of the public road network impacted by the peat slide.

Vehicle movements also took place associated with materials required for the construction of barrages and plant utilised for the works. Materials were transported both from the main wind farm site and from borrow pits as described by Chapter 2. Plant arrived at the works sites primarily from the main wind farm site.

Numbers of personnel, and typical plant types, are per those listed in Section 14.3.1 of this chapter. The volumes of materials and associated vehicle numbers are provided in Table 14-6.

Table 14-6 Approximate Material Volumes

Location	Approx. Quantities / Volumes	Material Source	Approx. Vehicles Numbers *assuming dumper
Barrage 1	900 m^3	Borrow Pit adjacent Barrage 1	91
Replacement access track to Barrage 1	830 m long track 4.5 m width Approx. 3,735 m3 materials	Borrow Pit adjacent Barrage 1 & wind farm site	376

Location	Approx. Quantities / Volumes	Material Source	Approx. Vehicles Numbers *assuming dumper
Barrage 2	650 m^3	Borrow Pit adjacent Barrage 1	65
Track to Barrage 2	293 m long track 4 m width Approx. 1,172 m3 rock materials	Borrow Pit / Quarry 3 on Wind Farm site	118
Barrage 3	350 m^3	Borrow Pit adjacent Barrage 1	35
Barrage 4	300 m^3	Unknown but likely local quarry*	30

**Material volumes are not significant and despite source being unknown the route to site are likely to have been similar to those considered elsewhere by this chapter, with no overall change to impact assessment.*

By November 2003 the majority of the barrages were constructed. Immediate response works lasted approximately 1.5 months. While users of the Black Road would have experienced temporary intensification of vehicle volumes during this period, given the absence of residential properties on the local roads surrounding Barrage 1 and Barrage 2 impacts are considered to have been **temporary, negative, slight** in the locality of the specific works sites during this time.

Beyond November 2003, until approximately November 2005, there were intermittent works carried out at various barrages, peat repositories and drainage / cleaning works as described by Chapter 2. These intermittent works are not considered to have resulted in significant impacts.

In August 2005 response works were again undertaken following heavy rains. These works were very localised in order to improve drainage and again resulted in only **temporary, negative, slight** effects on the local network.

New Access Track

An access track was constructed in order to facilitate access for the construction of Barrage No. 2 in response to the peat slide. Materials used for construction of the access track were sourced from a borrow pit within the wind farm site.

Effects as a result of this construction were **temporary, negative and slight** at the time of construction, beyond which neutral impacts occurred.

Replacement of Existing Access Track

An existing access track was replaced in order to facilitate access for the construction of Barrage No. 1 in response to the peat slide. Materials used for building the access track were sourced from the borrow pit adjacent Barrage 1 and the on-site wind farm borrow pits.

Again, impacts as a result of this construction were **temporary, negative, slight** at the time of construction, beyond which **neutral effects** occurred.

Bridge Repairs – Public Roads

As a result of the peat slide over-topping was experienced at both Black Road Bridge on the Black Road (561367.49, 703601.55 ITM) and Flaggy Bridge on the R353 (561137.3483, 702585.7451 ITM). This over-topping resulted in damage to bridge parapets and temporarily prevented vehicle movements on both roads at the impacted locations.

Clearance works were undertaken in order to remove peat and to replace damaged parapets and walls at these locations. Both as a result of the peat-slide itself and the clean-up works, both roads were closed for durations of approximately 1-2 weeks. Diversions and road closures were managed by GCC during this period. However, if required, local access was facilitated with some delays experienced by users of local routes. **Temporary, negative, significant** impacts were experienced during these events.

Plate 13 illustrates these works at Flaggy Bridge.

Plate 13: R353 Repair Works post Peat Slide

Tree Felling at Repositories

As noted in Chapter 2 approximately 25 ha of trees were felled as a result of the peat slide. The resulting impacts relating to traffic and transport would have been associated with the traffic movements for the removal of those trees.

Movements were via the local road network and Black Road, similar to those during the construction to October 2003. Although there may have been a temporary local intensification of vehicles movements associated with the felling there was no significant change in overall impact associated with the removal of trees from the site.

Bridge Repairs – Private Lands

Repair works were also undertaken at Unnamed Bridge C (561069.97, 702004.2172 ITM, also identified on Figure 14-6) including repairs to bridge parapets and deck slab. During these works' impacts were limited to those experienced by the private landowner and deemed to be temporary significant at individual level, but with no impact to the general public.

14.3.1.2.1 Summary of Offsite Peat Slide Works Impacts

In summary, during the response to the peat slide, negative impacts on the surrounding roads, traffic and transport network resulted in the following effects:

- **Temporary, significant, negative effects were experienced by users of the local network in the immediate vicinity of the Project.**
- **Beyond the local network, temporary, imperceptible, negative effects were experienced by users of the national network.**

14.3.1.3 Operation Phase – March 2006 – Mid 2020

This section identifies the impacts which occurred during the operation of the wind farm between March 2006 and 2020. Roads, traffic and transport impacts during the operational period are associated with the following aspects of the Project:

- General Operation & Maintenance Requirements
- Remedial Works to Wind Farm Site Roads
- Repair Works to Surrounding Road Network, associated with the Wind Farm
- Electrical Works

Specific works undertaken, aside from routine operation and maintenance, are outlined by Chapter 2.

General Operation & Maintenance Requirements

Personnel Movements

During project operation, personnel movements to and from the site typically comprised those associated with wind farm, substation and OHL maintenance activities.

As outlined by Chapter 2 Vestas staffing accounts for a team of approximately 4-6 people on site. In addition, there have been occasional requirements for personnel at either Derrybrien or Agannygal Substation and ESB Wind Farm management staff.

These personnel travelled to and from the site in either private vehicles or Light Goods Vehicles (LGV's).

Volumes were low and likely to have resulted in **imperceptible** impacts.

Plant Movements – to Wind Farm Site

Plant movements associated with the operation of the wind farm project to date include those required for road repairs, turbine / other component maintenance and plant associated with cutting back of tree regrowth.

Any plant transported to the site would be per the haul routes illustrated previously. Movements are infrequent and likely to have resulted in **imperceptible** impacts.

Material Movements

Material movements during its operational phase are primarily associated with the following material movements:

- General waste management.
- Repair works to on-site access tracks requiring geogrid, crushed rock and granular blinding.
- Maintenance and repair of on-site drainage.
- On-site tree management; note that felled trees are not typically removed from site.
- Tree felling to the west and immediately adjacent to the site.
- Upgrade to turbine control systems requiring delivery of 7.6 km of new fibre-optic cable.
- Minor clearing of debris from barrages.

Any material movements to / from the site would again be per the haul routes illustrated previously. Most movements were infrequent and would have resulted in **not- significant** impacts.

Movements associated with tree felling during operations are described below, assuming felling occurred across an 18-month period. The exact dates of felling activities are unknown; however, it is known that they occurred generally over a three-year period but outside of the April to August window. An assumption that felling would have occurred for six months of each of those three years has been assumed for the assessment herein.

The following summarises the maximum daily movements as a result of felling:

- Maximum average daily removals of approximately 7 flatbeds / trailers.
- Maximum daily movements of approximately 14 flatbeds / trailers.

These movements would have resulted in **short-term, negative, slight effects** on the immediately surrounding local road network.

Remedial Works to Wind Farm Site Roads

In 2014 remedial works were undertaken to the site roads within the wind farm site. These road improvement works entailed:

- Filling potholes with class 6F2 granular material;
- Placing of geogrid reinforcement; and
- Placing of approximately 150 mm crushed rock capping material and 10mm granular blinding.

In addition to the above general maintenance works road improvement works were undertaken to widen an existing floating road over culverts at Turbines T10, T24, T35, T50, T66.

In 2017 approximately 7.6 km of new fibre-optic cable was installed on-site. In addition to typical trench and burial activities the works included the placement of 75 mm diameter galvanized pipe at five on-site road crossings to lay the cable under floating roads.

Impacts associated with the above were largely associated with the importation of materials and personnel / plant movements. Works were typically temporary in duration and with **not-significant** impacts.

Repair Works to Surrounding Road Network, Associated with the Wind Farm

In 2012 remedial works were undertaken to Black Road consisting of the following at approximately 10 locations:

- Surface works comprising filling of pot holes.
- Edge repairs comprising replacement of tar strips at road edge.

Works were required due to road deterioration as a result of non-wind farm traffic. Works were undertaken in order to facilitate safe access to the site by cranes, in the event that this would be required.

These works did not result in significant impacts.

Electrical Works

During the operational phase routine inspection and maintenance along the OHL resulted in some cutting back of tree regrowth along the route of the OHL. Cut materials were left in-situ on the ground and not removed off-site. General maintenance activities were also intermittently undertaken at Agannygal Substation.

Impacts associated with the above were largely associated with movement of personnel / plant. Works were typically temporary in duration with no impacts leading to significant effects.

14.3.1.3.1 Summary of Operational Impacts (which have occurred)

Overall, during operation of the project, impacts on the surrounding roads, traffic and transport network resulted in the following effects, both negative and positive:

- **Negative impacts which occurred on the surrounding network resulted in short-term, negative, slight effects.**
- **Slight, long-term, positive effects were experienced by road users as a result of the infrastructure improvements made to roads and bridges during the construction phase.**

14.3.2 Impacts which are Likely to Occur

14.3.2.1 2020 – End of Operational Phase

Potential impacts on roads, traffic and transport, between 2020 and the end of the operational phase (circa. 2040), are likely to occur in relation to the following:

- Potential impacts associated with the ongoing maintenance of the project roads, including the importation of maintenance / repair materials and plant / personnel requirements to do the works.
- Potential impacts associated with the ongoing maintenance of the project infrastructure (e.g. turbines, electrical plant, substations and OHL).

These impacts are not anticipated to differ from those outlined in Section 14.3.1.3 and summarised by Section 14.3.1.3.1.

14.3.2.2 Decommissioning

This section identifies the impacts which are likely to occur as a result of the ultimate decommissioning of the Project, circa 2040. As noted by Chapter 2 the decommissioning strategy considered herein comprises the removal of above ground infrastructure. Various aspects of the Project will remain in situ post decommissioning including hardstands, access tracks, barrages and repositories.

Potential impacts on roads, traffic and transport as a result of decommissioning activities are likely to be similar to those experienced during the construction of the Project although to a much lesser extent. As noted in Chapter 2 decommissioning is expected to take in the order of 24 months.

Specifically, it is anticipated that impacts will be experienced in relation to the following aspects of decommissioning activities:

- General Project Requirements
- Civil Works
- Electrical Works

General Project Requirements

Personnel Movements

Table 14-7 identifies the number of construction personnel who are expected to attend site during decommissioning. These estimates have been prepared with consideration for the numbers during construction stage. The number of personnel below represents peak conditions and during many periods' personnel numbers are expected to be lower than those shown below.

Table 14-7 Construction Personnel

Phase & Personnel	Peak Personnel Numbers
Gort Windfarms Ltd. and agents' staff	Approximately 4 – 10
Dismantling, general ~& civil works contractors	Up to 40
Electrical works contractors	Approximately 15 (OHL and LV cable works) Agannygal Substation 15

Personnel movements are expected to be fairly evenly distributed across the decommissioning duration of 24 months.

Per construction stage most decommissioning personnel are expected to arrive at the project site compound, OHL works' locations or Agannygal substation in private / developer vehicles. It is not expected that there will be any readily available public transport to serve the project site given its rural location.

Assuming a vehicle occupancy rate of 1.25 for the peak scenario (i.e. when the highest personnel numbers will be present; 80 in total from Table 14-7) equates to approximately 64 vehicles arriving to and departing from the project site each working day resulting in total movements of 128 on the local network. This represents the maximum scenario.

The M18 has average daily flows as follows (2019 volumes, refer TII counter data at www.nratrafficdata.ie):

- 4482 northbound vehicles; and
- 4566 southbound vehicles.

These volumes will equate to less than 2% of the one-way daily traffic movements on the M18 and are deemed imperceptible.

However, per construction stage, impacts on Black Road and the surrounding local road network will be more significant given the low baseline levels which exist on the local road network. Additional traffic volumes are expected to have a more evident impact on local road users and to result in **short-term, negative, moderate effects**.

Plant Movements

Table 14-8 below identifies the key plant which are expected to be used during decommissioning in addition to some of the plant identified earlier in Table 14-4.

Table 14-8 Typical Plant (Decommissioning)

Plant	Plant (Cont'd)
Personnel 4WD vehicles (15 – 20 no.)	Compressor & head
Puller – tensioner x 2	Transit vans
Teleporter x 2	Chains, other small tools
Stringing wheels	Drum stands
Conductor drums	Drum carriers

All of the above plant will be transported to the site on the haul routes illustrated by Figure 14-3. Per construction stage, movements associated with the delivery of plant to the site will be low and typically involve a single trip to site and a single trip away from site. As a result, movement of plant equipment is considered unlikely to have a significant impact on any of the haul routes identified. Movements will be concentrated at the start and end of the overall decommissioning programme.

Material Removal (including materials for reuse and recycling materials)

Table 14-B, included in Appendix 14-B, identifies the key materials and equipment to be removed during decommissioning, in addition to movements associated with reinstatement works to the Ennis-Shannonbridge OHL. Where possible wind turbine components will be removed off site for recycling purposes as appropriate.

Haul routes will be per those illustrated by Figure 14-3 and Figure 14-4 with minor amendments in locations where road improvements / schemes take place prior to decommissioning. In order to minimise impacts on local networks all efforts will be made to use major roads (e.g. national and motorway class roads) as soon as practically possible following departure from site. In that regard all materials, irrespective of their end use, are expected to travel to the M18. From there, the route of travel will be dependent on the end use.

Movements of HGV's are largely expected to be spread across the 24-month decommissioning period. However, the following summarises the approximate daily movements anticipated at peak periods:

- Average HGV movements during peak period.
    - Average daily removals of approximately 5 HGV's per day (one-way) assuming a condensed 1-month window for decommissioning of the barrages when peak HGV movements will occur.
- For durations outside of the peak period average daily removals of approximately 1 HGV per day (one-way) are anticipated.

- There will be periods where more intense activity onsite results in higher daily movements however any impacts are not anticipated to be more significant.

Abnormal load removals are largely expected to be spread across a 6-month period. Movements are proposed to take place overnight along the majority of the route wherever possible however due to safety requirements it is likely that movements from the wind farm site to Derrybrien Village on the R353 will take place in the hours of daylight.

The following summarises the maximum daily movements at peak periods during the project:

- Peak abnormal movements.
    - Maximum daily removals of approximately 3 (rounded up) abnormal loads.
    - Maximum daily movements of approximately 5 (rounded up) abnormal vehicles.

During peak HGV removals impacts are expected to result in **temporary, negative, moderate impacts** on the immediately surrounding local road network. During abnormal removals impacts are expected to result in **temporary, negative, moderate impacts** on the immediately surrounding local road network.

Civil Works

As outlined by Chapter 2 of this rEIAR the majority of civils works undertaken during the construction of the project (e.g. access tracks, turbine hardstands) are proposed to remain in-situ after decommissioning.

However, decommissioning activities are proposed to include the removal of Barrage No. 3 and Barrage No. 4.

Removal of these two barrages will involve the movement of materials from the site of the barrages to Borrow Pit 3 within the main wind farm site where materials will be deposited. It is estimated that approximately 220 (rounded up) HGV movements between the barrage location and the wind farm would be required in order to undertake this decommissioning activity.

Works are expected to be temporary in nature, similar to construction phase, over which **temporary, slight, negative** impacts would occur on the transport network between the two locations where an intensification of use would occur.

As noted in Chapter 8 of this rEIAR, removal of the barrages should preferably occur between May and September and during dry periods as identified by Chapter 11. Accordingly, impacts will be restricted to a maximum duration of 5 months; although works are assumed to take place over 1 month in order to inform an assessment of peak period impacts in this chapter.

Impacts relating to these material movements have been captured above (refer General Project Requirements – Material Removal).

Electrical Works

As identified in Chapter 2 of this rEIAR, decommissioning will also include the removal of the Project OHL and Agannygal Substation and materials associated with these.

The transport routes proposed to be used during these decommissioning activities are illustrated by Figure 14-7 and Figure 14-8. However, final determination of the routes will be subject to detailed design at a time closer to the proposed time for undertaking decommissioning activities. Minor works may be required in order to provide access including hedge trimming, widening of access gates etc.

Overall, the effects likely to occur as a result of these activities are expected to be the same as those experienced during the construction stage, albeit over a shorter duration.

14.3.2.2.1 Summary of Decommissioning Effects

In summary, during decommissioning of the Project, negative impacts on the surrounding roads, traffic and transport network are likely to result in the following effects:

- **Effects which are likely to occur on the local network in the immediate vicinity of the project are expected to be temporary, negative and moderate.**
- **Beyond the local network, effects which are likely to occur on the national network are expected to be temporary, imperceptible, negative.**

However, the following positive effects are also likely to occur as a result of the improvements made to public infrastructure:

- **Slight, long-term, positive effects were experienced by road users as a result of the infrastructure improvements made to roads and bridges during the construction phase.**

14.4 Cumulative Impacts

14.4.1 Cumulative impacts which have occurred

During all phases of the project cumulative impacts may have occurred in association with other projects / works in the area, or projects with the same receiving environment as the Project.

In assessing these potential cumulative impacts, and as described by Section 14.1.4, difficulties were encountered in sourcing historical information in relation to these other projects. The details provided below have been sourced primarily from planning files.

In addition to those detailed below there are a number of other projects / activities identified by Chapter 2 where no detail on cumulative impact is provided herein in the absence of any potential opportunity for cumulative effects, relating to roads, traffic and transport. This includes the Gort Regional Water Supply Scheme, the Flood Relief Schemes and the M18 Motorway Upgrade described by Chapter 2.

Projects / activities which are considered relevant to this chapter of the rEIAR are outlined in further detail below.

14.4.1.1 Sonnagh Old Wind Farm

Sonnagh Old Wind Farm ("Sonnagh Old"), including the associated 38kV OHL, is also located within the Slieve Aughty Mountains, to the north of the Derrybrien Wind Farm. Sonnagh Old was commissioned a year before Derrybrien Wind Farm in 2004. It is understood that construction of the two projects did overlap in the years 2003 and 2004.

In accordance with the Traffic Management Plan (TMP) for the Sonnagh Old project, all deliveries to the site would arrive from the Loughrea (north) direction. As such the haul routes for the project differed from those used for the Derrybrien Wind Farm project.

Given the absence of overlap in haul routes, and despite the overlap in construction periods, it is not considered that there were any cumulative impacts on roads, traffic and transport as a result of the Sonnagh Old Wind Farm project.

Further, construction personnel travelling to both sites from either the Gort or Loughrea direction would only have experienced very short shared distances for travel, to both project locations, resulting in imperceptible cumulative impacts.

14.4.1.2 Keeldeery Wind Farm (2000 & 2009 – 2010)

Keeldeery Wind Farm, located approximately 3 km to the west of Derrybrien Wind Farm, was granted planning permission in early 2000s. Circa. 2007 internal access roads were constructed on site. A later application for an extension to the planning permission was granted. In addition, a further application and subsequent appeal (in 2009 and 2010) for the redesign of the Keeldeery Wind Farm was ultimately refused and the project was never fully constructed.

The activities which were undertaken at Keeldeery Wind Farm would have coincided with the operational phase of Derrybrien Wind Farm. Cumulative impacts which may have occurred would relate to the undertaking of these civil works within the Keeldeery site (neutral impacts) and the movement of personnel, plant and equipment for the undertaking of these works. Those movements may have resulted in cumulative impacts on the surrounding transport network.

The level of these impacts is difficult to determine as no traffic impacts are included in the original Environmental Impact Statement (EIS) for the wind farm. However, given the different access roads which were likely to have been used for Keeldeery Wind Farm and the relatively low volumes of traffic associated with the works undertaken at Keeldeery Wind Farm, the cumulative impact is not expected to have been significant and impacts do not differ from those outlined by Section 14.2.9.

14.4.1.3 Tynagh Power Station (2003 _ 2004)

Permission was granted in 2003 for the construction of the Tynagh Power Station, in a location at Tynagh Mines, east of Loughrea between Loughrea and Portumna in Co. Galway. In 2004 / 2005 construction of the power station took place, coinciding with the construction of the Derrybrien Wind Farm.

The EIS prepared for the power station stated a maximum impact as follows, which would result in a cumulative impact when considered in conjunction with the Derrybrien Wind Farm project:

- During construction:
    - Peak workforce of 350 – 400 personnel arriving to / from the site in peak periods.
    - 10 HGV arrivals and departures per hour during peak activities.
- During operation:
    - Permanent workforce of approximately 54 personnel in addition to temporary shift workers.
    - Peak movements equate to 56 light vehicles in the evening peak.
- Direction of travel of light vehicles split with 78% of traffic travelling north towards the N65 and 22% travelling south towards the Lisheen junction.
- Direction of travel of HGV's split with 90% of traffic travelling north towards the N65 and 10% travelling south towards the Lisheen junction.
- The EIS does not identify any significant impacts in relation to roads and traffic as a result of either construction or operation stage.

Given the location of the project and the absence of any significant overlap in haulage routes it is not considered that there were any cumulative impacts on roads, traffic and transport as a result of the Tynagh Power Station project. Haulage for the project does include the N65 national road, also used for the Derrybrien Wind Farm, however impacts associated with either project are not considered significant in the context of overall traffic volumes on the N65.

14.4.1.4 Tynagh 220 kV Grid Connection (2004)

Permission was granted in 2004 for the construction of the Tynagh 220 kV Grid Connection, associated with the power station referenced in Section 14.4.1.3. The route of the grid connection was from the power station at Tynagh to the existing Oldstreet – Cashla OHL. The grid connection ran from the station in a north east direction.

Given the general location of the grid connection and the resulting absence of overlap in haul routes between these works and the Derrybrien Wind Farm project as described by Section 14.4.1.3, it is not considered that there were any cumulative impacts on roads, traffic and transport as a result of the Tynagh 220 kV Grid Connection project.

14.4.1.5 Bridge Repair Works (2005 / 2006)

In approximately 2005 / 2006 (exact date unknown) works were undertaken at Beagh Bridge (547806.9145, 700644.977 ITM). Works comprised remediation efforts to this privately-owned bridge, on private lands.

Works were minor and temporary in nature and did not result in themselves in significant impacts nor when considered cumulatively with the overall Derrybrien Wind Farm project.

14.4.1.6 Cloghvoley Sand Extraction (Approx. 2008 Onwards)

Cloghvoley sand extraction activities relate to a GCC permission (refer 08/1664) for sand extraction at a site located at Cloghvoley, to the south-east of Derrybrien Wind Farm. Permission was granted in May 2008.

From an assessment of aerial photos, it is evident that the permitted activities have commenced; although the date of commencement was unknown at the time of writing this chapter.

In accordance with the planning files, traffic generated as a result of the project is in the order of 8-10 loads per day. This traffic would travel on the R353; although in which direction is unclear from the documents on file.

The operational activities at Cloghvoley Sand Extraction would have coincided with the operational phase of Derrybrien Wind Farm. Cumulative impacts which may have occurred would relate to cumulative traffic movements on the R353 as a result of both projects.

Given the low levels of traffic proposed as part of the Cloghvoley project and the low movements associated with the operation of Derrybrien Wind Farm the cumulative impact is not expected to have been significant and the impact assessment does not differ from that contained within Section 14.2.9.

14.4.1.7 Ballinakill Quarry Extension (2015)

In 2015 an extension was sought for the Ballinakill Quarry, located to the south east of the wind farm with access onto the R353. The EIS for the quarry extension stated a maximum impact as follows, which would result in a cumulative impact when considered in conjunction with the Derrybrien Wind Farm project:

- 40 HGV's generated by the quarry on the R353.
- EIS states that 50% of these HGV's would move in a westbound direction.
- Results in 40 daily movements in the peak quarry operational scenario, on the R353 to the west of the quarry.
- Light vehicle movements are extremely low.
- EIS notes that the above movements are not likely to impact on the carrying capacity of the R353.

During the operation of the Derrybrien Wind Farm Project (the Project) the above movements, combined with the movements as a result of the Project itself, would not alter the impact assessment carried out herein at Section 14.3.1.3. Neither the impacts associated with the operation of Ballinakill Quarry or the Project are classified as significant, and therefore the cumulative impacts are also not considered to result in significant effects.

14.4.1.8 Ballinakill Quarry Extension (2018)

In 2018 a further extension was sought for the Ballinakill Quarry. The EIAR for the 2018 quarry extension stated a maximum impact as follows, which would result in a cumulative impact when considered in conjunction with the Derrybrien Wind Farm project:

- 44 HGV's generated by the quarry on the R353.
- EIAR states that 50% of these HGV's would move in a westbound direction.
- Results in 44 daily movements in the peak quarry operational scenario, on the R353 to the west of the quarry.
- EIS notes that the above movements are not likely to impact on the carrying capacity of the R353.

During the operation of the Derrybrien Wind Farm Project (the Project) the above movements, combined with the movements as a result of the Project itself, would not alter the impact assessment carried out herein at Section 14.3.1.3. Neither the impacts associated with the operation of Ballinakill Quarry or the Project are classified as significant, and therefore the cumulative impacts are also not considered to result in significant effects.

14.4.1.9 Moneypoint – Oldstreet 400 kV OHL (circa. 2020 / 2021)

At the time of writing the Moneypoint – Oldstreet OHL refurbishment works had commenced, although they halted in Q1 2020 due to construction workplace restrictions.

Refurbishment works coincide with the operational phase of Derrybrien Wind Farm. Given the relatively low levels of activity on the OHL refurbishment project, which primarily comprises maintenance activities (painting etc.), minor parts replacement

and access provisions for same, but ultimately no significant replacement of overall structures, no cumulative significant effects are anticipated as a result of the two projects.

14.4.1.10 Ennis – Shannonbridge 110 kV OHL (circa. 2023 / 2024)

The Derrybrien Wind Farm connects into the Ennis – Agannygal OHL. Potential cumulative impacts associated with the two relate to those associated with the decommissioning of the Derrybrien Wind Farm and are dealt with under Section 14.3.2.

14.4.1.11 Coillte Quarry

A Coillte owned quarry, located to the south-east of Derrybrien Wind Farm east of the junction of the R353 and Black Road, has been operating periodically for an unknown period.

Accepted as being post-1964 (introduction of the Planning Acts) documents in relation to quarry registration were submitted to GCC in April 2005 by Coillte – the site owners.

The overall extraction area of the quarry is relatively small (1.3 hectares) with activity described as ‘periodic’. Operating hours are 7 am to 6 pm weekdays and 7 am to 1 pm on Saturdays.

Traffic movements are again described as ‘periodic’ and quantified as 15 to 20 loads for forest road repairs – although the frequency of those works is not specified.

The operational activities at the quarry may have coincided with the both the construction and operational phases of Derrybrien Wind Farm. Cumulative impacts which may have occurred would relate to cumulative traffic movements on the R353 as a result of both projects.

Given the seemingly low levels of traffic described as part of the quarry project the cumulative impact is expected to have largely related to Derrybrien Wind Farm activities and the impact assessment does not differ from that contained within Section 14.2.9.

14.4.1.12 Turbary within and Immediately Adjacent to Wind Farm Site

As described in Chapter 2 an area of approximately 83 ha of land occupies the eastern part of the wind farm site. Of this approximately 15ha had been converted to forestry lands having been planted prior to the project development and subsequently felled by Coillte. The remaining circa 67ha are drained turbary lands Turbary lands also extend immediately beyond the site to the east covering an area of approximately 15ha. Location and extent of these lands, in addition to number of plots, are described in further detail by Chapter 2

Extents of activities at these sites are relatively unknown during the construction period for the project aside from evidence that activities were not intense. Accordingly, during construction, it is not anticipated that any significant impacts arose relating to roads, traffic and transport as a result of the cumulative impacts of turbary activities and wind farm activities.

Since 2012 mechanical cutting of the turn has been undertaken and there has been an increase in the number of plots where mechanical turf cutting has been carried out. in addition to continued traditional methods of turf cutting including the use of a sausage machine. However, despite this change in approach to harvesting, in relation to roads, traffic and transport, it is still considered unlikely that anything aside from minor cumulative impacts, albeit non-significant, would have been experienced in the surrounding area.

14.4.1.13 Peat Extraction

As noted by Chapter 2 aside from activities associated with turbary rights (see Section 14.4.1.12) no other peat extraction activities subject to a development consent have been identified within the vicinity of the Project. Accordingly, no cumulative impacts are identified in this regard.

14.4.1.14 Adjacent Coniferous Forestry Plantations

As noted by Chapter 2 the extent of forestry in the area surrounding the Project has not changed appreciably since prior to Project construction. However, both ongoing felling and planting are features of the ongoing maintenance of the surrounding area and as noted in Chapter 2, based on the age profile of much of the forestry estate may be subject to felling in the coming decade. These activities are not expected to coincide with the anticipated Project decommissioning date of circa. 2040 and therefore no significant cumulative impacts are anticipated in that regard. Some minor cumulative impacts may occur should minor felling and planting activities impact on the same receiving network as the ongoing operation of the Project. However, given the non-significant nature of the Project operation it is not anticipated that this would give rise to significant effects.

14.4.1.15 Planting in Lieu of Felling on Wind Farm Site

As described by Chapter 2 planting, in compensation for felling undertaken on the wind farm site, was carried out at lands in County Tipperary and Country Roscommon. The planting locations are over 50 km and 80 km respectively from the wind farm site and are not physically connected to the project site.

Planting occurred between 2003 and 2008. The distance between the wind farm site and the planting locations mean that there is no significant overlap in routes to either location and no cumulative effects were likely to have been experienced during activities.

14.4.2 Cumulative impacts which are occurring

There are no known significant cumulative impacts occurring.

14.4.3 Cumulative impacts which are likely to occur

During the ongoing operation of the wind farm, impacts as a result of ongoing operation and maintenance are deemed temporary, not-significant with slight, long-term, positive impacts occurring as a result of the improved infrastructure (roads and bridges) upgraded during the construction phase.

At the time of ultimate decommissioning a Traffic Management Plan will be prepared which will include proposals to manage any cumulative impacts resulting from

potential coinciding of decommissioning activities with any other activities proposed in the area at that time.

14.5 Remedial (Mitigation) Measures and Monitoring for Significant Effects

During the construction of the Project, the following mitigation measures were implemented in order to reduce significant effects relating to roads, traffic and transport:

- Significant volumes of construction materials were sourced on-site thereby reducing impacts on the surrounding transport network in relation to material movements to the site.
- Deliveries of abnormal loads were undertaken in the hours of darkness as much as possible in order to minimise impacts on road users and effects experienced by them.

No significant effects are identified for the operational phase of the Project.

For the ultimate decommissioning of the Project the following mitigation measures are proposed:

- During general project decommissioning activities, including personnel movements and material removal from site, activities will only be undertaken between the hours of 7 am to 7 pm Monday to Saturday in order to minimise impacts on the surrounding transport network and its users. Exceptional circumstances may exist where works outside these times are required however these will only be undertaken with the prior agreement of GCC.
- Prior to the commencement of decommissioning a Traffic Management Plan (TMP) will be prepared and agreed with GCC which will provide a detailed description of the strategy for traffic management during all decommissioning activities in order to minimise impacts on the surrounding roads, traffic and transport network and its users. This will include restrictions during local events or periods of greater use of the local network by the general public. The TMP will also include monitoring requirements in relation to the condition of the surrounding local road network and the management of dust and debris on same as a result of decommissioning activities.
- Similar to the construction phase, material / equipment movements from the site will be required to adhere to the haul routes referred to within this chapter, and these routes will be included in the TMP.
- During decommissioning activities, it is proposed that transportation of abnormal loads will largely be undertaken overnight to avoid disruption to local users. Movements are proposed to take place overnight along the majority of the route wherever possible, however due to safety requirements it is likely that movements from the wind farm site to Derrybrien Village on the R353 will take place in the hours of daylight.

14.6 Residual Impacts

During the construction phase of the project, as a result of the design mitigation to use on site material as much as possible, impacts relating to material movements to / from the site were reduced. In addition, the movement of abnormal loads overnight as much as possible minimised disturbance to local road users.

However, despite the above measures overall effects during construction remained as follows, as outlined by Section 14.3.1.1.1, albeit only occurring during construction and therefore short-term in nature:

- **During peak construction stages, where maximum vehicle movements were experienced, short-term, significant, negative effects were experienced by users of the local network in the immediate vicinity of the Project.**
- **Beyond the local network, short-term, imperceptible, negative effects were experienced by users of the national network.**

During the response to the peat slide, although responses to impacts which resulted in temporary, significant, negative effect were prompt, there was no mitigation available to alter the following negative effects experienced, as outlined by Section 14.3.1.2.1:

- **Temporary, significant, negative effects were experienced by users of the local network in the immediate vicinity of the Project.**
- **Beyond the local network, short-term, imperceptible, negative effects were experienced by users of the national network.**

As identified by Section 0 operational impacts (not-significant), both positive and negative, remain as follows:

- **Negative impacts which occurred on the surrounding network resulted in temporary, not-significant effects.**
- **Slight, long-term, positive effects were experienced by road users as a result of the infrastructure improvements made to roads and bridges during the construction phase.**

As a result of the remedial measures proposed by Section 14.5 for decommissioning stage the residual effect on the surrounding local network is considered to be **temporary, moderate and negative** for the decommissioning stage. In addition, the following positive effect is also likely to occur as a result of the improvements made to public infrastructure:

- **Slight, long-term, positive effects were experienced by road users as a result of the infrastructure improvements made to roads and bridges during the construction phase.**

14.7 Conclusion

As outlined by Section 14.1.3 this chapter comprises a qualitative assessment of the impact of the Derrybrien Wind Farm project in relation to roads, traffic and transport.

The construction of the Derrybrien Wind Farm project and its operation to date have resulted in significant impacts on the surrounding roads, traffic and transport network. However, those significant impacts were typically temporary or short-term in nature.

There were no changes to roads or junction layouts, or implications on public transport networks as a result of the Project.

The impacts which were experienced to date were not dissimilar to those typical of a project of this scale in that they were primarily as a result of the movements of personal vehicles, abnormal loads and HGV's during the construction of the project. Some potential impacts were avoided through the use of on-site borrow pits and resources (e.g. trees felled used for access track construction).

During the operational period impacts were considered not-significant or positive; the same is likely for ongoing operation of the Project.

Impacts associated with the ultimate decommissioning of the wind farm are similar in type, although to a lesser extent, then those experienced in construction. However, a number of mitigation measures are proposed in order to reduce the impact of decommissioning activities reducing likely negative impacts to temporary, moderate.

The only long-term effects associated with the Project are **positive effects** associated with infrastructure upgrades.

14.8 References

The following documents were referenced in the production of this rEIAR chapter:

- EPA Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (2017)
- TII's Traffic and Transport Assessment Guidelines (2014)
- NRA Traffic Counter Data (https://web.nra.ie/TrafficCounterData/html/N18-06.htm)
- TII's TMU counters (https://www.nratrafficdata.ie)