

1. INTRODUCTION

1.1 Survey Background and Methodology

MKO were appointed by Curns Energy Ltd. to conduct stream characterization and other surveys of water crossings associated with the proposed Lyrenacarriga Wind Farm. Survey efforts relate to a Further Information request from An Bord Pleanála which sought clarity on;

“The potential impact of the proposal on the aquatic environment and associated fauna of the Tourig River, particularly at those sections of the river associated with crossing points”.

The survey work was conducted by Pádraig Desmond (B.Sc. Eco (Hons)) of MKO on the 7th and 8th of July 2022. Pádraig has worked in ecology for more than two years, having worked on various ecological projects. Pádraig has worked in consultancy for over a year and has carried out numerous stream characterization and water quality surveys. This report has been reviewed by Pat Roberts (B.Sc., MCIEEM) who has over 15 years’ experience in ecological assessment.

Surveys were carried out at nine existing water crossings proposed for upgrade and four proposed new water crossings associated with the wind farm access roads, the collector cable route, and the turbine delivery route. Previous surveys were carried out downstream of the proposed development site by MKO in 2019. These included three locations on the Glendine stream and one location on the Gortnafira stream.

The locations of the previous surveys carried out in 2019 and the thirteen water crossings associated with the proposed development are shown in Figures 4-6 and 7-3 of the EIAR and are again provided below.

Stream characterization surveys included kick sampling, habitat classification (Fossitt, 2000), stream morphology and assessments of submerged, emergent, and riparian macrophytes.

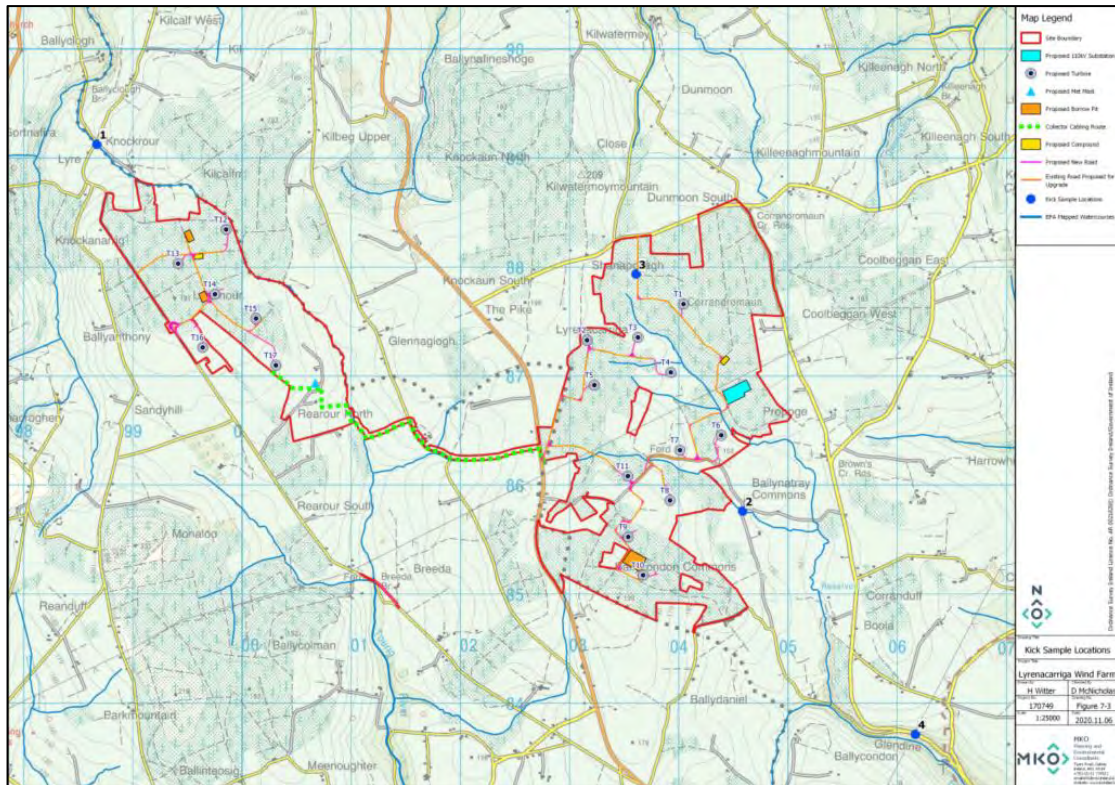


Figure 1 7-3 Kick Sample Locations

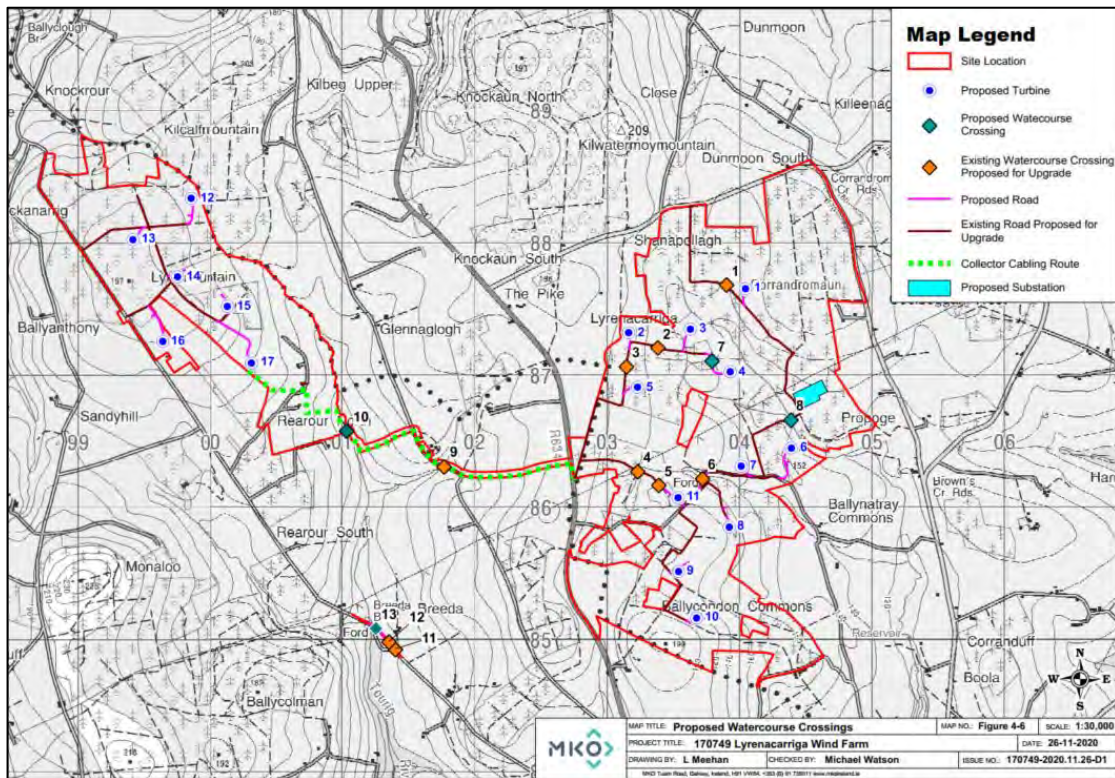


Figure 2 Figure 4-6 Proposed Watercourse Crossings
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2. DESCRIPTION OF RELEVANT WATER CROSSING WORKS

2.1 Watercourse Crossings

Proposed new stream crossings will be bottomless box culverts or clear span bridges and the existing banks will remain undisturbed. No in-stream excavation works are proposed and therefore there will be no direct impact on the watercourses at the proposed water crossing locations. Where the proposed underground onsite cabling route follows an existing road or road proposed for upgrade, the cable will pass over or below the culvert within the access road, with no instream works proposed.

The design of the proposed crossings follows Inland Fisheries Ireland's *'Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters'* (2016). During near stream construction work, double row silt fences will be emplaced immediately down-gradient of the construction area for the duration of the construction phase. There will be no batching or storage of cement allowed within 50 metres of the crossing construction areas.

The watercourse crossings will be constructed to the specifications of the OPW bridge design guidelines *'Construction, Replacement or Alteration of Bridges and Culverts - A Guide to Applying for Consent under Section 50 of the Arterial Drainage Act, 1945'*, and in consultation with Inland Fisheries Ireland. New watercourse crossings will require a Section 50 application (Arterial Drainage Act, 1945), which will be obtained prior to works. The river/stream crossings will be designed in accordance with OPW guidelines/requirements on applying for a Section 50 consent.

2.1.1 Clear Span Bridges

The construction methodology for the installation of a pre-cast concrete clear-span bridge is presented below:

- The access road on the approach to the watercourse will be completed to a formation level which is suitable for the passing of plant and equipment required for the installation of the watercourse crossing.
- All drainage measures along the proposed road will be installed in advance of the works.
- The abutment will consist of concrete panels which will be installed on a concrete lean mix foundation to provide a suitable base. The base will be excavated to rock or competent ground with a mechanical excavator with the foundation formed in-situ using a semi-dry concrete lean mix. The base will be excavated along the stream bank with no instream works required.
- Access to the opposite side of the watercourse for excavation and foundation installation will require the installation of pre-cast concrete slab across the watercourse to provide temporary access for the excavator.
- All pre-cast concrete panels and slabs/beams will be installed using a crane which will be set up on the bank of the watercourse and will be lifted into place from the bank with no contact with the watercourse.
- A concrete deck will be poured over the beams/slabs which span across the river. This will be shuttered, sealed and water tested before concrete pouring can commence.

2.1.2 Culverting

The construction methodology for the installation of a pre-cast concrete bottomless box culvert is presented below:

- The access road on the approach either side of the watercourse will be completed to a formation level which is suitable for the passing of plant and equipment required for the installation of the watercourse crossing.
- All drainage measures along the proposed road will be installed in advance of the works.
- A foundation base will be excavated to rock or competent ground with a mechanical excavator with the foundation formed in-situ using a semi-dry concrete lean mix. The base will be excavated along the stream bank with no instream works required.
- Access to the opposite side of the watercourse for excavation and foundation installation will require the installation of pre-cast concrete slab across the watercourse to provide temporary access for the excavator. Plant and equipment will not be permitted to track across the watercourse.
- Once the foundation base has been completed, the pre-cast concrete box culvert will be installed using a crane which will be set up on the bank of the watercourse and will be lifted into place from the bank with no contact with the watercourse.
- Where the box culvert is installed in sections, the joints will be sealed to prevent granular material entering the watercourse.
- Once the crossing is in position stone backfill will be placed and compacted against the structure up to the required level above the foundations.

3. DESK STUDY

3.1 Inland Fisheries Ireland (IFI) Records

Inland Fisheries Ireland has been assigned the responsibility by the EPA of delivering the fish monitoring requirements of the Water Framework Directive (WFD) in Ireland. A search of the Inland Fisheries Ireland database (wfdfish.ie) was carried out to inform the species that occur within the watercourses connected to the works area. While no data was available on the small watercourses that occur on the site or immediately downstream, information was available on the River Blackwater, which is located approx. 7.1km downstream of the site. A summary of findings based on annual reports conducted by IFI is provided in the paragraphs below.

The Blackwater River

Fish stock surveys were undertaken at 43 river sites throughout Ireland during the summer of 2010 as part of the programme of sampling fish for the Water Framework Directive (WFD). These surveys are required by both national and European law, with Annex V of the WFD stipulating that rivers are included within the monitoring programme and that the composition, abundance and age structure of fish fauna are examined (Council of the European Communities, 2000).

A total of ten fish species were recorded in the River Blackwater (Lismore) site. Salmon was the most abundant species, followed by flounder, eel, dace, stone loach, minnow, gudgeon, roach, lamprey and three-spined stickleback.

All watercourses associated with the proposed development are tributaries of the River Blackwater. These include the Tourig, the Glendine, and the Gortinafira. No inland fisheries Ireland records were available for these watercourses.

3.2 Environmental Protection Agency (EPA) Records

The Biotic Index of Water Quality (BIWQ) was developed in Ireland by the Environmental Protection Agency (EPA). Q-values are assigned using a combination of habitat characteristics and structure of the macro-invertebrate community within the waterbody. Individual macro-invertebrate families are classified according to their sensitivity to organic pollution and the Q-value is assessed based primarily on their relative abundance within a sample.

Table 3-1 illustrates the respective Q-value status results from monitoring stations located along rivers which flow through the site or along rivers which are fed directly by watercourses which flow through or around the site.

River Basin Management Plans (RBMPs) have been published for all River Basin Districts in Ireland in accordance with the requirements of the Water Framework Directive. The online EPA Envision map viewer provides access to water quality information and individual waterbody status for all the River Basin Districts in Ireland. The EPA Envision map viewer was consulted on 16th of August 2022 regarding the water quality status of the rivers which are located downstream of the study area. The WFD River Waterbody Status 2013 – 2018 for the watercourses which flow through the site have been set out in Table 3-2.

Table 3-1 Water quality monitoring stations and associated Q values

Watercourse Name	Sampling station	Location	Q-Value & Water Quality Status	Sampling Year
Tourig	TOURIG - Br SE of Ballycolman	E 201440 N 83450	4 (Good)	1997
	TOURIG - Br nr Park Ho	E 203902.84 N 79919.91	4 (Good)	2003
	Br SW of Tourig Hall	E 206418.87 N 80218.57	4 (Good)	2021
Glenaboy	Ballyclogh Br	E 198559.39 N 89700.72	3-4 (Moderate)	2021
	GLENABOY - Br N of Glenaboy	E 198807 N 89922.5	4 (Good)	1990
	GLENABOY - South Br Tallow	E 199412.45 N 93274.57	4 (Good)	1994
Blackwater	Tallowbridge	E 199887.88 N 94325.65	4 (Good)	2021
Glendine	GLENDINE (BLACKWATER) - Br SSW of Browns Crossroads	E 205232 N 85673.88	4-5 (High)	1990
	Glendine Ch E of Ballycondon	E 206415.58 N 83462.35	4 (Good)	2021
	GLENDINE (BLACKWATER) - 0.1km d/s Glendine Church	E 207120 N 82697.9	4-5 (High)	1990
	GLENDINE (BLACKWATER) - Glendine Br	E 207697.71 N 82345.23	4 (Good)	1990

Table 3-2. Watercourses on site with relevant water quality and Risk statuses

Name	Location	Status	Risk
Tourig	Headwaters originate on the eastern boundary of the western section of the proposed development. It flows southerly, crossing the connector cable route and turbine delivery route.	Good	Not at Risk
Gortnafira	Headwaters originate adjacent to the northern boundary of the western section of the proposed development site. It flows north westerly, away from the site, discharging into the Glenaboy.	Good	Not at Risk
Glendine	Headwaters originate within the eastern section of the proposed development site. Several tributaries flow easterly/south easterly through the site before the main Glendine stream flows south away from the site.	Good	Not at Risk

Status– WFD River Waterbody Status 2010-2015 Risk – WFD River Waterbodies Risk

4.

PREVIOUS SURVEYS

Kick sampling was carried out at watercourses both within and downstream of the proposed development site in order to inform baseline conditions. These were carried out on the 26th of September 2019. Representative locations along watercourses that drain the site were chosen for the assessment. The locations of each watercourse surveyed are provided in Figure 7-3 of the EIAR, which is provided again in section 1.

Biological water quality was assessed through kick-sampling each of these watercourses. Macro-invertebrate samples were converted to Q-ratings as per Toner et al. (2005)¹. The applied Q ratings followed the EPA water quality classes and Water Framework Directive status categories. All riverine samples were taken with a standard kick sampling hand net (250mm width, 500µm mesh size) from areas of riffle/glide utilising a two-minute sample, as per ISO standards for water quality sampling (ISO 10870:2012). Large cobble was also washed at each site where present.

Three of the four sample locations assessed were Q3 ‘Poor’, and one as Q3-4 ‘Moderate’.

Overall, the watercourses with the highest value for fish species were the lower survey reaches of the main watercourses that drain the proposed development site. The small watercourses located in the upper reaches of the catchment that occur within the site were generally upland, eroding watercourses and often featured dry, or partly dry features, generally not conducive to supporting resident salmonids, European eel, lamprey or white-clawed crayfish. These watercourses are generally small and subject to varying water levels associated with periodic rainfall events.

¹ Toner, P., Bowman, J., Clabby, K., Lucey, J., McGarrigle, M., Concannon, C., & MacGarthaigh, M. (2005). *Water quality in Ireland*. Environmental Protection Agency, Co. Wexford, Ireland.

5. WATER CROSSING STREAM CHARACTERIZATION AND OTTER SURVEY

The following sections outline the findings of the stream characterization for each of the 13 water crossing locations, including kick sample surveys and otter surveys, carried out by MKO on the 7th and 8th of July 2022.

5.1 Methodologies

5.1.1 Habitat classification

Habitats were classified in accordance with the Heritage Council's 'Guide to Habitats in Ireland' (Fossitt, 2000). Habitat mapping was undertaken in accordance with guidance set out in 'Best Practice Guidance for Habitat Survey and Mapping' (Smith et al., 2011).

Plant nomenclature for vascular plants follows 'New Flora of the British Isles' (Stace, 2010), while mosses and liverworts nomenclature follows 'Mosses and Liverworts of Britain and Ireland - a field guide' (British Bryological Society, 2010).

5.1.2 Otter survey

Dedicated otter surveys were conducted on the 7th and 8th of July 2022 of the watercourses within the study area. The otter survey was conducted as per TII (2009) guidelines (Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes). This involved a search for all otter signs e.g. spraints, scat, prints, slides, trails, couches and holts. In addition to the width of the rivers/watercourses, a 10m riparian buffer (both banks) was considered to comprise part of the otter habitat (NPWS 2009). The dedicated otter survey also followed the guidance as set out in NRA (2008) 'Guidelines for the Treatment of Otters Prior to the Construction of National Roads Schemes' and following CIEEM best practice competencies for species surveys (CIEEM, 2013²).

5.1.3 Kick sampling

At each water crossing where sufficient flow was present, three-minute kick samples were collected from the stream bed area of approximately one square metre with a standard handnet (250 mm x 250 mm, with a 300 mm bag depth and a 1 mm mesh size). One minute hand searches, of large objects such as tree branches or stones, was undertaken prior to each of the kick samples. The kick sampling time was then divided proportionally among the habitats present in the area, such as fast-moving riffles, shallow water, and silted banks. Samples were sorted on site. Specimens were identified using the FBA Guide to Freshwater Invertebrates (Dobson *et al.*, 2012).

² CIEEM, 2013, *Technical Guidance Series – Competencies for Species Survey*, Online, Available at: <https://cieem.net/resource/competencies-for-species-survey-css/> Accessed: 20.03.2021

5.2 Water Crossings

5.2.1 Water crossing 1 – Existing watercourse crossing proposed for upgrade

Located in the north-eastern section of the proposed development site, this is an existing 600 mm plastic culverted water crossing. This culvert was not embedded in the riverbed and had a lip on the downstream side, breaking stream continuity. The watercourse was approx. 1.5 meters wide with an average depth of 80 mm. Benthic substrate was composed of gravels with no siltation. This watercourse is classified an Upland/eroding river (FW1). Though the watercourse provides suitable commuting habitat for otter, no indications of otter using this watercourse were recorded.

No submerged or emergent vegetation recorded within the stream. Bankside vegetation included bramble (*Rubus fruticosus* agg.), ivy (*Hedera helix*), wild angelica (*Angelica sylvestris*) and fern species. Shading was high, dominated by willow (*Salix* sp.). Surrounding land use was predominantly forestry.

This watercourse was assigned a Q score of Q3. It was assigned this score as only group C invertebrates were recorded during the kick sample. This watercourse is unnamed and thus, unassigned a status for reference. The score is, however, lower than the status of the receiving Glendine stream which was Q4. The kick sample location is ITM 0603845 0587738 and was taken from a riffle section of the stream.

Table 5-1 Water crossing 1 Invertebrate Results

Indicator Group	Taxon	Dominance
Group A - Very Pollution Sensitive	None	None
Group B - Moderately Pollution Sensitive	None	None
Group C - Moderately Pollution Tolerant	<i>Gammarus</i>	Present
	<i>Baetis rhodani</i>	Present
	<i>Chironomids</i>	Present
Group D - Very Pollution Tolerant	None	None
Group E - Most Pollution Tolerant	None	None



Figure 5-1 Water crossing 1.

5.2.2

Water crossing 2 – Existing watercourse crossing proposed for upgrade

Located near the western boundary of the eastern section of the proposed development site, this is an existing 400 mm plastic culverted water crossing for a forestry road. The culvert was embedded in the riverbed but waterflow through it was very low. The watercourse was 300 mm wide with an average depth of 15 mm. Benthic substrate was composed of gravels with slight siltation. This watercourse is classified as a Drainage ditch (FW4). Though the watercourse provides suitable commuting habitat for otter, no indication of otter using this watercourse were recorded.

No submerged or emergent vegetation was recorded within the stream. Bankside vegetation included bramble (*Rubus fruticosus* agg.), rush (*Juncus effusus*), Yorkshire fog (*Holcus lanatus*), and wild angelica (*Angelica sylvatica*). Surrounding land use was predominantly forestry, which caused high shading.

No Q score was assigned at this water crossing as no suitable riffle or glide sections for kick sampling were in the vicinity. The location of the water crossing is ITM 0603329 0587270.



Figure 5-2 Water crossing 2

5.2.3

Water crossing 3 – Existing watercourse crossing proposed for upgrade

Located near the western boundary of the eastern section of the proposed development site, this is an existing 300 mm concrete culverted water crossing for a forestry road. This watercourse was dry at the time of survey. This feature was not classified as a watercourse as per Fossitt (2000) as it was dry at the time of the survey and did not support wetland vegetation. Therefore, this watercourse does not provide suitable habitat for otter.

No Q score was assigned at this water crossing as the channel was dry. The location of the water crossing is ITM 0603092 0587126.



Figure 5-3 Water crossing 3

5.2.4 **Water crossing 4 – Existing watercourse crossing proposed for upgrade**

Located west of centre of the eastern section of the proposed development site, this is an existing 400 mm concrete culverted water crossing for a forestry road. Stream width was 200mm wide with an average depth of 20mm. Heavy siltation and pooling was recorded upstream of the culvert. This watercourse is classified as a Drainage ditch (FW4). This watercourse does not provide suitable habitat for otter as it provides little fisheries potential for foraging and no suitable areas for resting or breeding were identified.

No instream or emergent vegetation was recorded within this watercourse. Bank vegetation was dominated by forestry, which created high shading.

No Q score was assigned at this water crossing as no suitable riffle or glide sections for kick sampling were in the vicinity. The location of the water crossing is ITM 0603329 0587270.



Figure 5-4 Water crossing 4

5.2.5 Water crossing 5 – Existing watercourse crossing proposed for upgrade

Located in the centre of the eastern section of the proposed development site, this is an existing 400 mm plastic culverted water crossing of the Ballynatray Commons stream, which discharges to the Glendine stream to the east, for a forestry road. The invert of the culvert was embedded in the substrate and there was continuous flow at both ends. The watercourse where the kick sample was taken, downstream of the culvert, was 500 mm wide with an average depth of 30 mm. This watercourse is classified as an upland/eroding stream (FW1). Though the watercourse provides suitable commuting habitat for otter, no indication of otter using this watercourse were recorded.

No submerged or emergent vegetation was recorded within the stream. Bankside vegetation included ivy (*Hedera helix*), wild angelica (*Angelica sylvatica*), bramble (*Rubus fruticosus* agg.), ferns and bryophytes. Surrounding land use was predominantly forestry, which caused high shading.

This watercourse was assigned a Q score of Q3. It was assigned this score as the sample was dominated by group C invertebrates with few occurrences of group D. This compares to the WFD status of Q4 given in the EPA map viewer. Kick sample location was ITM 0603368 0586227.

Table 5-2 Water crossing 5 Invertebrate Results

Indicator Group	Taxon	Dominance
Group A - Very Pollution Sensitive	None	None
Group B - Moderately Pollution Sensitive	None	None

Indicator Group	Taxon	Dominance
Group C - Moderately Pollution Tolerant	<i>Gammarus</i>	<i>Dominant</i>
Group D - Very Pollution Tolerant	<i>Chironimidae</i>	<i>Present</i>
Group E - Most Pollution Tolerant	<i>Tubificidae</i>	<i>Present</i>



Figure 5-5 Water crossing 5

5.2.6 Water crossing 6 – Existing watercourse crossing proposed for upgrade

Located in the centre of the eastern section of the proposed development site, this is an existing 500 mm plastic culverted water crossing of the Ballynatray Commons stream which discharges to the Glendine stream to the east, for a forestry road. The invert of the culvert was not embedded in the substrate, so flow continuity was broken. The kick sample was taken downstream of the culvert. Here, the stream was 1m wide with an average depth of 40 mm. This watercourse was classified as an upland/eroding stream (FW1). Though the watercourse provides suitable commuting habitat for otter, no indication of otter using this watercourse were recorded.

No submerged or emergent vegetation was recorded within the stream. Bankside vegetation included ivy (*Hedera helix*), wild angelica (*Angelica sylvestris*), cocks' foot (*Dactylis glomerata*), ragwort (*Jacobaea aquatica*), and willow (*Salix* sp.). Surrounding land use was predominantly forestry, which caused high shading.

This watercourse was assigned a Q score of Q3. It was assigned this score as the sample was dominated by group C invertebrates with few occurrences of group D. This compares to the WFD status of Q4 given in the EPA map viewer. Kick sample location was ITM 0603706 0586300.

Table 5-3 Water crossing 6 Invertebrate Results

Indicator Group	Taxon	Dominance
Group A - Very Pollution Sensitive	None	None
Group B - Moderately Pollution Sensitive	None	None
Group C - Moderately Pollution Tolerant	<i>Gammarus</i>	<i>Dominant</i>
	<i>Baetis rhodeni</i>	<i>Common</i>
Group D - Very Pollution Tolerant	<i>Flatworms</i>	<i>Common</i>
Group E - Most Pollution Tolerant	None	None



Figure 5-6 Water crossing 6

5.2.7 Water crossing 7 – Proposed Watercourse Crossing

A new water crossing is proposed of the Shanapollagh stream which discharges into the Glendine stream to the east. It is located north of centre of the eastern section of the proposed development site. Stream width was 400 mm wide with an average depth of 30 mm. This watercourse is classified as an upland/eroding stream (FW1). Though the watercourse provides suitable commuting habitat for otter, no indication of otter using this watercourse were recorded.

No submerged or emergent vegetation was recorded within the stream. Bankside vegetation included bracken (*Pteridium aquilinum*), wild angelica (*Angelica sylvestris*), bramble (*Rubus fruticosus* agg.), fox glove (*Digitalis purpurea*), marsh ragwort (*Jacobaea aquatica*), Yorkshire fog (*Holcus lanatus*), and hard rush (*Juncus inflexus*). Surrounding land use was predominantly forestry, which caused high shading, and tillage.

This watercourse was assigned a Q score of Q4. It was assigned this score as the sample was dominated by group C invertebrates with few occurrences of group D and group A. This is in line with the WFD status of Q4 given in the EPA map viewer. The kick sample location was ITM 0603742 0587168 and it was taken from a riffle section of the stream.

Table 5-4 Water crossing 7 Invertebrate Results

Indicator Group	Taxon	Dominance
Group A - Very Pollution Sensitive	<i>Heptageniidae</i>	<i>Few</i>
Group B - Moderately Pollution Sensitive	<i>None</i>	<i>None</i>
Group C - Moderately Pollution Tolerant	<i>Gammarus</i>	<i>Dominant</i>
	<i>Baetis rhodeni</i>	<i>Few</i>
	<i>Uncased Caddis</i>	<i>Few</i>
Group D - Very Pollution Tolerant	<i>Flatworms</i>	<i>Few</i>
Group E - Most Pollution Tolerant	<i>None</i>	<i>None</i>



Figure 5-7 Water crossing 7

5.2.8 Water crossing 8 – Proposed Watercourse Crossing

A new water crossing is proposed of the Shanapollagh stream which discharges into the Glendine stream to the east. It is located to the east of the proposed development site. Stream width was 900 mm wide with an average depth of 50 mm. This watercourse is classified as an upland/eroding stream (FW1). Though the watercourse provides suitable commuting habitat for otter, no indication of otter using this watercourse were recorded.

No submerged vegetation was recorded within the stream, but hemlock water dropwort (*Oenanthe crocata*) was recorded as emergent. Bank vegetation included fox glove (*Digitalis purpurea*), hemlock water dropwort (*Oenanthe crocata*), soft rush (*Juncus effusus*), and wild angelica (*Angelica sylvestris*). Surrounding land use was conifer forestry but willow (*Salix* sp.) dominated the stream bank, causing high shading.

No Q score was assigned at this water crossing as there was no suitable riffles or glides to kick sample from. The location of the water crossing is ITM 0604324 0586728.



Figure 5-8 Water crossing 8

5.2.9 Water crossing 9 - Existing watercourse crossing proposed for upgrade

Located on the proposed collector cable route for the proposed development, this is an existing culverted water crossing of the Glennagloagh stream for the L7809 road. This discharges into the Tourig stream approx. 625m downstream. It is composed of a stone bridge. Stream width was 1m wide with an average depth of 50 mm. This watercourse is classified as an upland/eroding stream (FW1). Otter spraint was recorded on a rock along the stream bank. The stream provides suitable commuting/foraging habitat for otter but it does not provide suitable breeding/resting habitat.

Submerged and emergent bryophytes were recorded within the stream while bank side vegetation was composed of hogweed (*Heracleum sphondylium*), hearts tongue (*Asplenium scolopendrium*), spleenworts (*asplenium* spp.), ivy (*Hedera helix*), and opposite leaved golden saxifrage (*Chrysosplenium oppositifolium*).

This watercourse was assigned a Q score of Q4. It was assigned this score as the sample was dominated by group B and C invertebrates with few occurrences of group D and group A. This is in line with the WFD status of Q4 given in the EPA map viewer. The kick sample location was ITM 0601713 0586363 and it was taken from a riffle section of the stream.

Table 5-5 Water crossing 9 Invertebrate Results

Indicator Group	Taxon	Dominance
Group A - Very Pollution Sensitive	<i>Heptageniidae</i>	<i>present</i>
Group B - Moderately Pollution Sensitive	<i>Leuctra</i>	<i>Few</i>
	<i>Goeridae</i>	<i>Numerous</i>
Group C - Moderately Pollution Tolerant	<i>Gammarus</i>	<i>Numerous</i>
	<i>Baetis rhodeni</i>	<i>Common</i>
	<i>Uncased Caddis</i>	<i>Few</i>
Group D - Very Pollution Tolerant	<i>Ancylus</i>	<i>Present</i>
	<i>Chironomids</i>	<i>Few</i>
Group E - Most Pollution Tolerant	<i>None</i>	<i>None</i>



Figure 5-9 water crossing 9

5.2.10 Water crossing 10 – Proposed Watercourse Crossing

Located on the proposed collector cable route for the proposed development, this is a proposed water crossing of the Tourig stream. Stream width was 2.5m wide with an average depth of 70 mm. This watercourse is classified as an upland/eroding stream (FW1). Though this watercourse provides suitable foraging and breeding habitat for otter, no indication of otter using this watercourse were recorded.

There was no submerged vegetation in the stream but pondweed (*Lemna* sp.) was recorded as emergent vegetation. Bank vegetation was predominantly hemlock water dropwort (*Oenanthe crocata*), bramble (*Rubus fruticosus* agg.), Yorkshire fog (*Holcus lanatus*), and ferns. Heavy shading was recorded which was dominated by willow (*Salix* sp.), gorse (*Ulex europaeas*), and alder (*Alnus glutinosa*).

This watercourse was assigned a Q score of Q4. It was assigned this score as the sample was dominated by group B and C invertebrates with common occurrences of group D and group A. This is in line with the WFD status of Q4 given in the EPA map viewer. The kick sample location was ITM 0600982 0586662, and it was taken from a glide section of the stream.

Table 5-5 Water crossing 10 Invertebrate Results

Indicator Group	Taxon	Dominance
Group A - Very Pollution Sensitive	<i>Heptageniidae</i>	<i>Common</i>
Group B - Moderately Pollution Sensitive	<i>Goeridae</i>	<i>Numerous</i>
Group C - Moderately Pollution Tolerant	<i>Gammarus</i>	<i>Common</i>
	<i>Baetis rhodeni</i>	<i>Common</i>

Indicator Group	Taxon	Dominance
	<i>Ephemerelellidae</i>	<i>Few</i>
	<i>Coleoptera</i>	<i>Present</i>
Group D - Very Pollution Tolerant	<i>Chironomids</i>	<i>Common</i>
Group E - Most Pollution Tolerant	<i>None</i>	<i>None</i>



Figure 5-10 Water crossing 10

5.2.11 Water crossing 11 - Existing watercourse crossing proposed for upgrade

Located on the proposed turbine delivery route, this is an existing water crossing of an unnamed stream under an agricultural field. Existing culvert is 2 no. 300 mm plastic pipes. Stream width was 50 mm wide with an average depth of 30 mm. This watercourse is classified as an upland/eroding stream (FW1). Though this watercourse provides suitable commuting habitat for otter, no indication of otter using this watercourse were recorded.

No submerged or emergent vegetation was recorded within the stream. Bankside vegetation included wild angelica (*Angelica sylvatica*) and ivy (*Hedera helix*), with moderate shading of beech (*Fagus sylvatica*).

This watercourse was assigned a Q score of Q3-4. It was assigned this score as the sample was dominated by group B and C invertebrates with few occurrences of group D and group A. This is an unnamed

watercourse so there is no current WFD status assigned. The kick sample location was ITM 0601392 0584990, and it was taken from a riffle section of the stream.

Table 5-6 Water crossing 11 Invertebrate Results

Indicator Group	Taxon	Dominance
Group A - Very Pollution Sensitive	<i>Heptageniidae</i>	<i>Few</i>
Group B - Moderately Pollution Sensitive	<i>Goeridae</i>	<i>Numerous</i>
Group C - Moderately Pollution Tolerant	<i>Gammarus</i>	<i>Common</i>
	<i>Baetis rhodeni</i>	<i>Few</i>
	<i>Uncased Caddis</i>	<i>Few</i>
Group D - Very Pollution Tolerant	<i>Flatworms</i>	<i>Common</i>
	<i>Chironomids</i>	<i>Few</i>
Group E - Most Pollution Tolerant	<i>None</i>	<i>None</i>



Figure 5-11 water crossing 11

5.2.12 Water crossing 12 - Existing watercourse crossing proposed for upgrade

Located on the proposed turbine delivery route this is an existing water crossing of an unnamed stream under the L7806 road. This feature was not classified as a watercourse as per Fossitt (2000) as it was dry

at the time of the survey and did not support wetland vegetation. Therefore, this watercourse does not provide suitable habitat for otter.

No Q score was assigned at this water crossing as the stream was dry, so no kick sample was taken. The location of the water crossing is ITM 0601298 0585047.

5.2.13 Water crossing 13 – Proposed Watercourse Crossing

Located on the proposed turbine delivery route, this is a proposed water crossing of the Tourig stream under the L7806 road. Stream width was 3m wide with an average depth of 150 mm. This watercourse is classified as an upland/eroding stream (FW1). Though this watercourse provides suitable foraging and breeding habitat for otter, no indication of otter using this watercourse were recorded.

Bryophytes were recorded as submerged and emergent vegetation while bank vegetation was composed of bryophytes, ivy (*Hedera helix*), and ferns. Shading was high of this stream which was dominated by alder (*Alnus glutinosa*).

This watercourse was assigned a Q score of Q4. It was assigned this score as the sample was composed of numerous Group B invertebrates with common numbers of Group A. The sample also had common to few samples of Group C. This is in line with the WFD status of Q4 given in the EPA map viewer. Kick sample location was ITM 0601176 0585140.

Table 5-7 Water crossing 13 Invertebrate Results

Indicator Group	Taxon	Dominance
Group A - Very Pollution Sensitive	<i>Heptageniidae</i>	<i>Common</i>
Group B - Moderately Pollution Sensitive	<i>Goeridae</i>	<i>Numerous</i>
Group C - Moderately Pollution Tolerant	<i>Gammarus</i>	<i>Common</i>
	<i>Baetis rhodeni</i>	<i>Common</i>
	<i>Uncased Caddis</i>	<i>Few</i>
	<i>Ephemeralla</i>	<i>Few</i>
Group D - Very Pollution Tolerant	<i>Chironomids</i>	<i>Common</i>
Group E - Most Pollution Tolerant	<i>None</i>	<i>None</i>



Figure 5-12 Water crossing 13

6. DISCUSSION

The thirteen watercourse crossings associated with the proposed development were surveyed visually and kick samples were carried out in those where suitable flow was present. Five crossing points lacked suitable flow, so no kick samples were taken.. These results provide baseline conditions of the water crossings associated with the access roads, collector cable route and turbine delivery route as shown in Table 6-1.

Table 6-1 Water crossing location with Q-scores

Site	Development Infrastructure	Grid Reference (ITM)	Q-value
1	Wind Farm Access Road	E0603848 N0587745	Q3
2	Wind Farm Access Road	E0603329 N0587270	Unsuitable
3	Wind Farm Access Road	E0603092 N0587126	Unsuitable
4	Wind Farm Access Road	E0603177 N0586333	Unsuitable
5	Wind Farm Access Road	E0603336 N0586231	Q3
6	Wind Farm Access Road	E0603667 N0586280	Q3
7	Wind Farm Access Road	E0603738 N0587170	Q4
8	Wind Farm Access Road	E0604334 N0586722	Unsuitable
9	Collector Cable Route	E0601715 N0586371	Q4
10	Collector Cable Route	E0600979 N0586641	Q4
11	Turbine Delivery Route	E0601347 N0584990	Q3-4
12	Turbine Delivery Route	E0601298 N0585047	Unsuitable
13	Turbine Delivery Route	E0601200 N0585150	Q4

7.

CONCLUSION

The surveys carried out by MKO in 2019 and 2022 provide an up-to-date baseline of conditions of watercourses within and in close proximity to the proposed works which will aid in monitoring any future changes in water quality. The water crossings within the overall proposed development site include nine existing water crossings proposed for upgrade and four proposed new water crossings.

Four of the water crossings of tributaries of the Glendine stream in the eastern section of the proposed development site were typically forestry drains which were either dry or had too little flow to take kick samples. Samples were taken in four streams and in these, Q scores ranged from Q3 to Q4.

Water crossings of the Tourig stream and its tributaries in the southwestern section of the proposed development site were typical headwater streams i.e., typically shallow on steep gradients with variable flow. All but one water crossing in this area had sufficient water to take kick samples, and yielded Q scores from Q3-4 to Q4.

The proposed water crossing works associated with the proposed development have the potential to impact on these habitats, including the Tourig stream, and their associated fauna, via habitat loss, the creation of barriers to the movement of aquatic species, and the deterioration of water quality due to the runoff of pollutants arising from the construction and operational phases of the proposed development. These impacts have, in the absence of best practice and mitigation, the potential to cause significant effects on fauna within and downstream of the proposed development site.

As indicated in the CEMP (Section 3.2.6) and again in the EIAR (Section 7.6.4.1.1), in relation to new water crossings, detailed procedures and mitigations are provided to ensure no significant effects on watercourse habitats or their associated fauna have been provided and include but are not limited to the following: *Proposed new stream crossings will be bottomless or clear span pre-cast bridges and the existing banks will remain undisturbed. No in-stream excavation works are proposed and therefore there will be no direct impact on the watercourse at the proposed crossing locations. Where the proposed underground onsite cabling route follows an existing road or road proposed for upgrade, the cable will pass over or below the culvert within the access road.*

In relation to water crossings proposed for upgrade, the CEMP (Section 3.2.6) summarizes the mitigations detailed in the EIAR (Section 10.5) that will be followed. The CEMP further details the construction methodology which further ensures no significant effects on watercourse habitats or their associated fauna. This methodology includes:

- The access road on the approach watercourse will be completed to a formation level which is suitable for the passing of plant and equipment required for the installation of the watercourse crossing.
- The installation of the culvert will take place in low flow conditions.
- Where a flow exists, the water running through the watercourse channel will be pumped around the water crossing location and back into the watercourse channel downstream of the works area.
- Where over pumping is required, measures will be taken to ensure that the pumped water discharge does not disturb the channel bed with the force of water from the discharge. A steel plate to reduce the force of the flow will be used where appropriate.
- The project engineer will determine the required gradient of the culvert. The culvert must be laid at a gradient that will ensure water is contained within the culvert at all times. Where necessary a rock armour dam will be installed within the channel to reduce flow and ensure an acceptable depth of water remains within the culvert. Where a gradient of 1 – 1.5% is identified, the use of a baffle has been recommended.

- The bed of the watercourse channel will be excavated, if necessary, to achieve the correct line and to allow the culvert to be embedded 300mm into the base of the existing drain.
- The embedded section will be allowed to fill naturally with existing material within the base of the drain or with suitable drainage material such as gravel or round shingle where deemed applicable.
- The culvert will be lowered into place using an excavator with a lifting mechanism.
- Large stone boulders (approx. 400mm), sourced from the on-site borrow pits, will be placed over the culvert to create a headwall for the culvert and a suitable sub-base for road construction.
- Smaller 50mm stone sourced on site will be placed upon the sub-base to construct the road over the water crossing.

Furthermore, all works in relation to water crossings will be undertaken in line with NRA Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes

Following the implementation of best practice and mitigation measures detailed above and, in the CEMP, the proposed new and upgraded water crossings associated with the proposed development will not result in significant effects on watercourse habitats, including the Tourig stream, and their associated fauna. The use of box culverts will ensure riverbanks are retained and no barriers to connectivity will be created, allowing the migration of salmonids and other species up and down stream. Furthermore, following the implementation of best practice construction methodology and mitigations, there is no potential for deterioration in water quality arising from the construction and operational phases of the proposed development.

The proposed water crossings associated with the proposed windfarm development will not result in significant impacts on the Tourig stream, or ex-situ species such as otter and salmonids. No barriers to connectivity or loss of habitat are expected and pathways for deterioration of water quality due to runoff of pollutants have been robustly blocked.

8.

REFERENCES

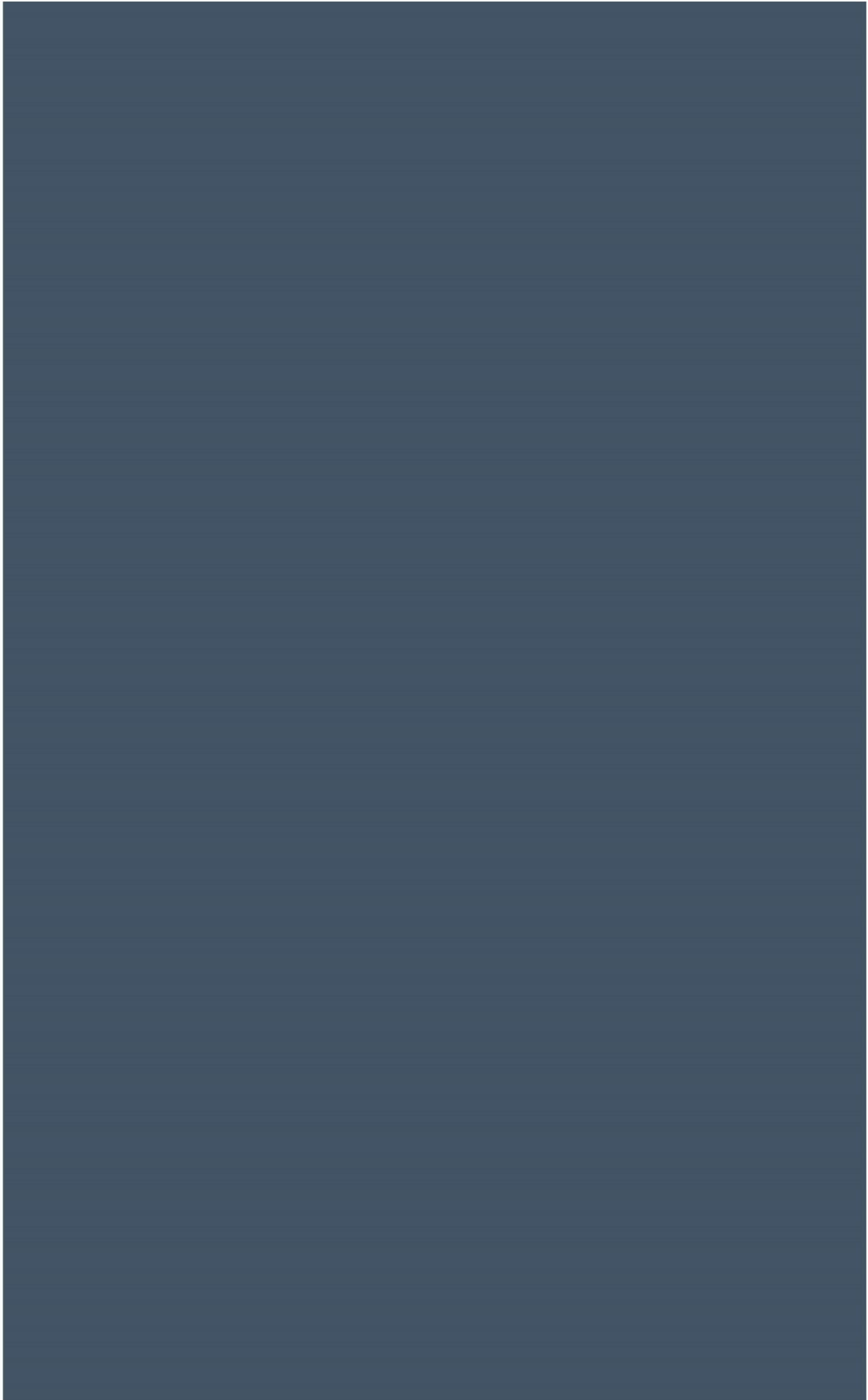
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APPENDIX 4

AWN TECHNICAL NOTE

TECHNICAL NOTE

Project **Lyrenacarriga Wind Farm**

Subject **ABP Further Information Response**

Author **Dermot Blunnie**

Date **5 October 2022**

Ref. **227501.0283NT01**

The Tecpro Building,
Clonshaugh Business & Technology Park,
Dublin 17, Ireland.

T: + 353 1 847 4220
F: + 353 1 847 4257
E: info@awnconsulting.com
W: www.awnconsulting.com

1.0 INTRODUCTION

AWN Consulting Ltd. (AWN) are the acoustic consultants for this project and prepared the noise and vibration chapter and assessment of the submitted Environmental Impact Assessment Report (EIAR). This document has been prepared in response to a Further Information (FI) request received from An Bord Pleanála (ABP) on specific items relating to noise.

In response to the items relating to noise in the FI, appropriate clarifications and further comments are presented in the following sections of this document to clarify, expand, and confirm previous statements within the submitted EIAR. The noise and vibration assessment carried out as part of the submitted EIAR is considered comprehensive and robust.

AWN is a multidisciplinary consultancy offering specialist design advice, expert witness, and litigation support in respect of a wide range of engineering and environmental disciplines. AWN hosts Ireland's largest acoustic consultancy team with seventeen full-time consultants working in the field. The company has extensive experience in issues relating to wind farm noise having been involved numerous wind farm projects across the island of Ireland.

This document was prepared by Dermot Blunnie (Senior Acoustic Consultant), holds a BEng (Hons) in Sound Engineering, MSc in Applied Acoustics and has completed the Institute of Acoustics (IOA) Diploma in Acoustics and Noise Control. He has been working in the field of acoustics since 2008 and is a member of the Institute of Engineers Ireland (MIEI) and the Institute of Acoustics (MIOA). He has extensive knowledge and experience in relation to commissioning noise monitoring and impact assessment of wind farms as well as a detailed knowledge of acoustic standards and proprietary noise modelling software packages. He has commissioned noise surveys and completed noise impact assessments for numerous wind farm projects within Ireland.

Cork Office
Unit 5, ATS Building,
Carrigaline Industrial Estate,
Carrigaline, Co. Cork.
T: + 353 21 438 7400
F: + 353 21 483 4606

AWN Consulting Limited
Registered in Ireland No. 319812

2.0 ABP FURTHER INFORMATION REQUESTS

This document has been prepared in relation to specific items highlighted in correspondence received from ABP concerning the proposed wind farm development and all associated infrastructure in the townlands of Lyrenacarriga, Co. Waterford and Lyremountain, Co. Cork (ABP Ref: ABP-309121-21). The relevant extracts of the ABP correspondence that are discussed here are as follows:

“Details of Proposed Turbines

It is noted that the development description as set out in the statutory notices refers to a maximum overall blade tip height of 150 metres. To enable the Board to determine the application please confirm the nature and extent of the development for which permission is sought, by reference to plans and particulars which describe the works to which the application relates, in compliance with the relevant provisions of the Planning and Development Regulations 2001 as amended.

If the development for which permission is sought incorporates a range of options, please indicate clearly in the application documentation the detail of all such options and confirm that each option has been fully assessed within the application documentation including within the Environmental Impact Assessment Report and Natura Impact Statement.”

The applicant has confirmed that several candidate turbines are being considered for the site with hub heights in the range from 83.5 m up to 93.5 m. It is understood that the candidate turbines represent a range of typical turbine models that would be suitable for the Proposed Development. To assist ABP, the assessments presented in Chapter 13 of the EIAR are updated and supplemented here to consider the various potential candidate turbines. Please see Section 3.0 of this correspondence for further details on this issue.

In addition, the ABP correspondence FI states the following:

“Noise

- (a) Submissions received including the report from the Planning Authority (Cork County Council) and a number of reports authored by Acoustic/Related Consultants/Experts which critically assess the information provided in Chapter 13 of the EIAR and related appendices. You are requested to review the submissions and respond/clarify accordingly.*
- (b) Your attention is drawn to the Draft Revised Wind Energy Development Guidelines 2019 and in particular to reference within Chapter 2 (Section 2.4.5.3.1) of the EIAR whereby it is stated that the design of the proposed development has been developed with the provisions of the draft guidelines in mind.*

Please expand.”

The submissions referred to in the ABP correspondence have been reviewed and addressed in Section 4.0 of this document.

Item 3 (b) is addressed in Section 2.3 of the main FI response document. Additional comments on the Draft Guidelines with respect to noise are presented here, as they are relevant to items 3 (b): From Section 13.4.2.1.4 of the EIAR:

“In December 2019, the Draft Revised Wind Energy Development Guidelines December 2019 were published for consultation and therefore have yet to be finalised. Therefore, in line with best practice, the assessment presented in the EIAR is based on the current guidance outlined in Section 5.6 of the Wind Energy Development Guidelines for Planning Authorities.”

In addition to the statements made in the EIAR, the following comments are presented in relation to the *Draft Revised Wind Energy Development Guidelines (DRWEDG19)*.

As part of the public consultation several concerns relating to the proposed approach of the DRWEDG19 have been expressed by various parties. Specific concerns expressed by a group of acoustic professionals working in the field are most relevant. The group was made up of acousticians who act for wind farm developers, Councils, Government bodies and residents’ groups (all of whom are members of the Institute of Acoustics, IOA¹). The group contained several of the authors / contributors to ETSU-R-97, the IOA Good Practice Guide (IOA GPG) and the IOA Amplitude Modulation Working Group, which are all referenced extensively in the draft guidelines. A statement from the cross party group can be reviewed at:

<https://www.ioa.org.uk/wind-energy-development-guidelines-wedg-consultation-irish-department-housing-planning-community-and>

The following statement is of note from the response (a copy of the full response is included in Appendix A):

“a number of acousticians working in the field have raised serious concerns over the significant amount of technical errors, ambiguities and inconsistencies in the content of the draft WEDG and these were highlighted during the consultation process by a group of acousticians”

It is AWN’s opinion that the DRWEDG19 document does not outline a best practice approach in terms of the assessment of wind turbine noise. Therefore, in line with best practice, which includes ESTU and IOA GPG methodologies as described in Section 13.4.2.1 of the EIAR, the assessment presented in the EIAR is based on the current best practice guidance outlined in Section 5.6 of the *Wind Energy Development Guidelines for Planning Authorities, 2006 (WEDG06)*.

The original ETSU-R-97 concepts, on which both the WEDG06 and DRWEDG19 are based, underwent a thorough standardisation and modernisation in 2013 with the Institute of Acoustics publication of the “*A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise*” (IOAGPG) including 6 Supplementary Guidance Notes, all of which bring together the combined experience of acoustic consultants in the UK and Ireland in the application of these methods. Numerous improvements in the accuracy and robustness are described, including the treatment of wind shear and the general adaptation to larger wind turbines. The assessment in the EIAR is therefore in full accordance with the latest best-practice methods.

If updated Wind Energy Guidelines are published during the application process for the Proposed Development it is anticipated that any relevant changes affecting the noise assessment will be addressed through an appropriate planning condition, or where a supplementary assessment is necessary, through provision of additional information.

¹ The Institute of Acoustics (IOA) is the UK’s professional body for those working in acoustics, noise, and vibration.

3.0 REVIEW OF CANDIDATE TURBINES

It has been advised by the Applicant that the following turbines are representative of the potential candidate models for the site, and confirmation of the upper and lower range hub height (HH) for each model is provided in Table 1.

Turbine Manufacturer	Model	MW	HH (m)
Nordex	N117	3.6	91 ^{Note A}
			91.5
			83.5
Nordex	N133	4.8	83.5
Vestas	V117	4.3	83.5
			93.5
GE	117	4.23	83.5
			93.5
Siemens	SWT 113	3.2	83.5
			93.5

Table 1 Review of Candidate Turbines

Note A: The turbine model assessed in Chapter 13 of the EIAR was a Nordex N117 3.6 MW without Serrated Trailing Edge (STE) blades at 91 m HH.

Noise prediction calculations have been prepared for all candidate turbines outlined in Table 1. The calculation methodologies outlined in Section 13.3 of the EIAR for turbine noise prediction have been followed in this updated assessment. Where additional information and clarifications are required in terms of the current predictions these have been outlined as necessary in the following sections.

3.1 Background Noise and Criteria

As the background noise criteria are a function of the hub height (HH), it has been necessary to revise the regression analysis of the background noise data presented in the EIAR where HH of 91 m was used. As the highest HH in Table 1 is 93.5 m, there is a slight shift of the noise levels at each standardised wind speed. This results in a slight reduction in the derived background noise level in some wind speed bins. This is normal as for an increased HH, the noise levels at standardised wind speeds reduce slightly. The results of this exercise are presented in Table 2, values highlighted red indicate a change in the derived background noise level.

Location	Period	Derived $L_{A90,10 \text{ min}}$ Levels (dB) at various Standardised 10m Height Wind Speed (m/s) for a HH of 93.5 m							
		3	4	5	6	7	8	9	10
A (H08 Proxy)	Day	21.9	22.4	25.1	29.0	33.4	37.4	40.2	40.8
	Night	16.6	17.5	20.0	23.8	28.5	33.7	39.0	44.2
C (H26 Proxy)	Day	23.6	25.2	27.7	30.8	34.3	38.0	41.7	45.1
	Night	16.6	17.8	20.0	22.9	26.5	30.4	34.5	38.6
D (H51)	Day	23.5	25.4	28.0	31.1	34.6	38.3	42.0	45.4
	Night	17.3	18.9	21.4	24.8	28.7	32.9	37.2	41.4
F (H45 Proxy)	Day	25.7	27.5	30.0	32.8	36.0	39.2	42.4	45.3
	Night	16.7	18.2	20.8	24.2	28.1	32.3	36.6	40.5
G (H64)	Day	23.7	25.5	27.9	30.8	33.9	37.3	40.6	43.8
	Night	17.5	18.7	20.6	23.2	26.5	30.4	34.8	39.8
H (H67)	Day	21.9	22.9	25.5	29.1	33.1	36.7	39.3	40.2
	Night	16.7	17.4	19.4	22.4	26.3	30.9	36.1	41.7

Table 2 Derived Noise Levels of $L_{A90,10 \text{ min}}$ for Various Wind Speeds

The derived background noise levels will be lowest for the highest hub height within the turbine range i.e., 93.5 m. To simplify the assessment, background noise levels for an assessment hub height of 93.5 m are presented for all scenarios in this review. This presents a conservative assessment as the derived background noise levels are lowest for the highest hub height in the range. The updated regression graphs are presented in Appendix B.

Based on the updated background noise levels presented in Table 2, the assessment noise criteria curves have been updated accordingly and are presented in Table 3. The same methodology as detailed in Section 13.4.2.1.1 of the EIAR has been applied here.

Location	Period	Derived $L_{A90,10\text{ min}}$ Criteria (dB) at various Standardised 10m Height Wind Speed (m/s)							
		3	4	5	6	7	8	9	10
A (H08 Proxy)	Day	40.0	40.0	40.0	40.0	45.0	45.0	45.2	45.8
	Night	43.0	43.0	43.0	43.0	43.0	43.0	44.0	49.2
C (H26 Proxy)	Day	40.0	40.0	40.0	45.0	45.0	45.0	46.7	50.1
	Night	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.6
D (H51)	Day	40.0	40.0	40.0	45.0	45.0	45.0	47.0	50.4
	Night	43.0	43.0	43.0	43.0	43.0	43.0	43.0	46.4
F (H45 Proxy)	Day	40.0	40.0	40.0	45.0	45.0	45.0	47.4	50.3
	Night	43.0	43.0	43.0	43.0	43.0	43.0	43.0	45.5
G (H64)	Day	40.0	40.0	40.0	45.0	45.0	45.0	45.6	48.8
	Night	43.0	43.0	43.0	43.0	43.0	43.0	43.0	44.8
H (H67)	Day	40.0	40.0	40.0	40.0	45.0	45.0	45.0	45.2
	Night	43.0	43.0	43.0	43.0	43.0	43.0	43.0	46.7

Table 3 Derived Noise Criteria Curves for Various Standardised Wind Speeds

As the change in background noise levels is small, the turbine noise criteria for the Proposed Development remain as stated in Table 13-21 in Section 13.6.3.1 of the EIAR and are based on the assigned representative background noise monitoring locations outlined in Table 13-11 and Figure 13-16 the EIAR.

In respect of locations where a resident is financially involved in the wind farm, Section 13.4.2.1.1 states, “*The ETSU-R-97 guidance allows for a higher level of turbine noise operation at properties that have an involvement in the development, both as a higher fixed level of 45 dB L_{A90} and/or a higher level above the prevailing background noise level. In line with the guidance a lower threshold of 45 dB $L_{A90,10\text{ min}}$ is applicable to NSLs involved in the proposed development (H61 and H64).*”

3.2 Turbine Noise Data

The following tables outline the turbine sound power levels that have been used for the various candidate turbines identified in Table 1.

3.2.1 Nordex N117 3.6MW (83.5 m HH)²

Standardised 10m Height Wind Speed (m/s)	Sound Pressure Level dB(A) per Octave Band Centre Frequency (Hz)								
	63	125	250	500	1000	2000	4000	8000	dB(A)
3	72.8	80.1	86.5	86.6	85.1	84.4	81.0	75.9	92.5
4	73.5	80.2	86.2	86.4	87.6	89.0	85.8	74.1	94.4
5	79.6	86.6	89.9	90.1	92.5	94.2	93.3	83.4	99.7
6	83.2	89.5	93.1	93.7	95.8	96.9	96.4	86.9	102.8
≥7	84.2	90.4	93.3	93.8	96.6	98.0	97.0	87.7	103.5

Table 4 Noise Data Used for Nordex N117 3.6MW (83.5 m HH) Serrated Trailing Edge (STE) Blades

3.2.2 Nordex N117 3.6MW (91.5 m HH)³

Standardised 10m Height Wind Speed (m/s)	Sound Pressure Level dB(A) per Octave Band Centre Frequency (Hz)								
	63	125	250	500	1000	2000	4000	8000	dB(A)
3	72.8	80.1	86.5	86.6	85.1	84.4	81	75.9	92.5
4	73.6	80.3	86.3	86.5	87.7	89.1	85.9	74.2	94.5
5	79.9	86.9	90.2	90.4	92.8	94.5	93.6	83.7	100
6	83.4	89.7	93.3	93.9	96	97.1	96.6	87.1	103
≥7	84.2	90.4	93.3	93.8	96.6	98	97	87.7	103.5

Table 5 Noise Data Used for Nordex N117 3.6MW (91.5 m HH) STE Blades

3.2.3 Nordex N133 4.8MW (83.5 m HH)⁴

Standardised 10m Height Wind Speed (m/s)	Sound Pressure Level dB(A) per Octave Band Centre Frequency (Hz)								
	63	125	250	500	1000	2000	4000	8000	dB(A)
3	74.7	82.5	85.5	86.4	86.9	85.6	81.3	72.1	93.0
4	75.9	83.3	86.7	87.6	88.1	86.8	82.5	73.3	94.2
5	81.5	88.5	92.3	93.2	93.6	92.4	88.1	78.9	99.7
6	85.6	92.6	96.4	97.3	97.8	96.5	92.2	83.0	103.9
≥7	86.2	93.2	97.0	97.9	98.4	97.1	92.8	83.6	104.5

Table 6 Noise Data Used for Nordex N133 4.8MW (83.5 m HH) STE Blades

² Nordex Report - Octave sound power levels Nordex N117/3600 Ref: F008_256_A14_EN Revision 00, 2018-06-07

³ Nordex Report - Octave sound power levels Nordex N117/3600 Ref: F008_256_A14_EN Revision 00, 2018-06-07

⁴ Nordex Report - Octave sound power levels Nordex N133/4800 Ref: F008_272_A14_EN Revision 02, 2020-01-31

3.2.4 Vestas V117 4.3MW (83.5 m HH)⁵

Standardised 10m Height Wind Speed (m/s)	Sound Pressure Level dB(A) per Octave Band Centre Frequency (Hz)								
	63	125	250	500	1000	2000	4000	8000	dB(A)
3	71.0	79.6	85.2	87.9	87.7	84.5	78.4	69.3	93.0
4	74.6	82.7	88.0	90.6	90.4	87.4	81.7	73.1	95.8
5	79.4	87.1	92.2	94.7	94.5	91.7	86.3	78.1	100.0
6	84.0	91.2	95.9	98.2	98.1	95.5	90.5	83.0	103.7
7	86.2	93.3	98.0	100.3	100.2	97.6	92.7	85.2	105.8
≥8	86.4	93.5	98.2	100.5	100.4	97.8	92.9	85.5	106.0

Table 7 Noise Data Used for Vestas V117 4.3MW (83.5 m HH)

3.2.5 Vestas V117 4.3MW (93.5 m HH)⁶

Standardised 10m Height Wind Speed (m/s)	Sound Pressure Level dB(A) per Octave Band Centre Frequency (Hz)								
	63	125	250	500	1000	2000	4000	8000	dB(A)
3	71.1	79.7	85.3	88.0	87.8	84.6	78.5	69.4	93.1
4	74.9	83.0	88.3	90.9	90.7	87.7	82.0	73.4	96.1
5	79.7	87.4	92.5	95.0	94.8	92.0	86.6	78.4	100.3
6	84.3	91.5	96.2	98.5	98.4	95.8	90.8	83.3	104.0
7	86.4	93.5	98.2	100.5	100.4	97.8	92.9	85.4	106.0
≥8	86.4	93.5	98.2	100.5	100.4	97.8	92.9	85.5	106.0

Table 8 Noise Data Used for Vestas V117 4.3MW (93.5 m HH)

3.2.6 GE 117 4.23MW (83.5 m HH)⁷

Standardised 10m Height Wind Speed (m/s)	Sound Pressure Level dB(A) per Octave Band Centre Frequency (Hz)								
	63	125	250	500	1000	2000	4000	8000	dB(A)
3	74.2	81.9	85.9	86.7	88.4	83.7	74.5	55.6	93.0
4	75.4	83.1	87.0	87.9	89.6	84.9	76.0	57.6	94.2
5	79.7	87.4	91.3	92.2	93.9	89.2	80.4	62.5	98.5
6	83.9	91.6	95.5	96.4	98.1	93.4	84.6	66.2	102.7
7	86.2	93.5	97.6	99.0	101.5	97.7	89.3	69.2	105.7
≥8	86.5	93.8	97.9	99.3	101.8	98.0	89.6	69.5	106.0

Table 9 Noise Data Used for GE 117 4.23MW (83.5 m HH)

⁵ Vestas Report - DMS 0067-7587 V02 V117-4.0&4.2 MW Third octave noise emission (Strong wind & Typhoon) – with serrated trailing edge.

⁶ Vestas Report - DMS 0067-7587 V02 V117-4.0&4.2 MW Third octave noise emission (Strong wind & Typhoon) – with serrated trailing edge.

⁷ GE Renewable Energy report: 20180101_Noise_Emission_NO_4.2-DFIG-117-xxHz_3MW_LNTE_EN_r03_R03_EN BB SO TO

3.2.7 GE 117 4.23MW (93.5 m HH)⁸

Standardised 10m Height Wind Speed (m/s)	Sound Pressure Level dB(A) per Octave Band Centre Frequency (Hz)								
	63	125	250	500	1000	2000	4000	8000	dB(A)
3	74.2	81.9	85.9	86.7	88.4	83.7	74.5	55.6	93.0
4	75.6	83.3	87.2	88.1	89.8	85.1	76.2	57.8	94.4
5	80.0	87.7	91.6	92.5	94.2	89.5	80.7	62.8	98.8
6	84.3	92.0	95.9	96.8	98.5	93.8	85.0	66.6	103.1
7	86.4	93.7	97.8	99.2	101.7	97.9	89.5	69.4	105.9
≥8	86.5	93.8	97.9	99.3	101.8	98.0	89.6	69.5	106.0

Table 10 Noise Data Used for GE 117 4.23MW (93.5 m HH)

3.2.8 Siemens Gamesa SWT113 3.2MW (83.5 m HH)⁹

Standardised 10m Height Wind Speed (m/s)	Sound Pressure Level dB(A) per Octave Band Centre Frequency (Hz)								
	63	125	250	500	1000	2000	4000	8000	dB(A)
3	76.4	80.0	83.1	83.2	84.2	83.4	80.0	70.8	90.6
4	80.7	84.3	87.4	87.5	88.5	87.7	84.3	75.1	94.9
5	85.3	88.9	92.0	92.1	93.1	92.3	88.9	79.7	99.5
6	90.1	93.7	96.8	96.9	97.9	97.1	93.7	84.5	104.3
7	91.8	95.4	98.5	98.6	99.6	98.8	95.4	86.2	106.0
≥8	91.8	95.4	98.5	98.6	99.6	98.8	95.4	86.2	106.0

Table 11 Noise Data Used for Siemens SWT113 3.2MW (83.5 m HH)

3.2.9 Siemens Gamesa SWT113 3.2MW (93.5 m HH)⁸

Standardised 10m Height Wind Speed (m/s)	Sound Pressure Level dB(A) per Octave Band Centre Frequency (Hz)								
	63	125	250	500	1000	2000	4000	8000	dB(A)
3	76.6	80.2	83.3	83.4	84.4	83.6	80.2	71.0	90.8
4	81.1	84.7	87.8	87.9	88.9	88.1	84.7	75.5	95.3
5	85.7	89.3	92.4	92.5	93.5	92.7	89.3	80.1	99.9
6	90.5	94.1	97.2	97.3	98.3	97.5	94.1	84.9	104.7
7	91.8	95.4	98.5	98.6	99.6	98.8	95.4	86.2	106.0
≥8	91.8	95.4	98.5	98.6	99.6	98.8	95.4	86.2	106.0

Table 12 Noise Data Used for Siemens SWT113 3.2MW (93.5 m HH)

As in the EIAR, the provided wind turbine sound power data in the previous tables are referenced in terms of the L_{Aeq} parameter. Best practice guidance contained within the *Institute of Acoustics Good Practice Guide* (IOA GPG) states that “ L_{A90} levels should be determined from calculated L_{Aeq} levels by subtraction of 2 dB”. Therefore, in accordance with best practice guidance, a 2 dB reduction has been applied to the predicted results in this assessment to represent L_{A90} levels.

For the purposes of all predictions presented in this report, to account for various uncertainties in the measurement of turbine source levels, a +2 dB uncertainty factor has been added to all noise emission values in line with guidance for wind turbine noise assessment contained in the Institute of Acoustics (IOA) document, *A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise* (2013) (IOA GPG).

⁸ GE Renewable Energy report: 20180101_Noise_Emission_NO_4.2-DFIG-117-xxHz_3MW_LNTE_EN_r03_R03_EN BB SO TO

⁹ Siemens Gamesa Renewable Energy – SWT-3.2-113 IIA R17 Developer Package rev 2

3.3 Review of Turbine Noise Predictions

Noise prediction calculations have been undertaken for each of the combinations listed in Table 1. The result of this review has confirmed that all candidate turbines with the hub height range will comply with the operational turbine noise criteria curves and no mitigation measures are required.

The full results are presented in Appendix C for the various scenarios.

If alternative turbine models, within the specified ranges, are procured for the Proposed Development an updated noise assessment will be prepared to confirm that the noise emissions will comply with the noise criteria and/or the relevant operational criteria associated with the grant of planning. As is standard for all projects, suitable curtailment strategies will be designed and implemented for alternative technologies the procured turbines to ensure compliance with the relevant noise criteria, should detailed assessment conclude that this is necessary.

There will be no change to the potential impacts or effects for operational phase of the Proposed Development and these remain as described in Section 13.7.3 of the EIAR.

4.0 RESPONSE TO OBJECTIONS & OBSERVATIONS

Several issues have been raised via submissions from third parties. A portion of these refer to the potential environmental noise impact from the Proposed Development. The primary issues raised in respect of the noise impact of the Proposed Development refer to the following topics:

- Health concerns and WHO Guidelines.
- Amplitude modulation.
- Infrasound and Low Frequency Noise.
- Wind Turbine Syndrome.
- Quality of background noise surveys.

Comment in relation to the issues raised above is provided in the following sections.

4.1 Health Concerns and the WHO Guidelines

Several third-party submissions claim that the noise impact of the proposed development should be assessed against the criteria in the World Health Organisation (WHO) document *Environmental Noise Guidelines for the European Region* (2018), rather than the current WEDG06 guidelines.

In terms of the WHO document *Environmental Noise Guidelines for the European Region* (2018) AWN can confirm that a detailed reasoning on this matter is provided in Section 13.4.2.1.5 of the EIAR and it is concluded that:

“It is therefore considered that the conditional WHO recommended average noise exposure level (i.e. 45dB L_{den}) if applied, as target noise criteria for an existing or proposed wind turbine development in Ireland, should be done with caution. The L_{den} criteria has been adopted as part of this assessment, this is based upon the review set out above and the conclusion that the conditional WHO recommended average noise exposure level (i.e. 45dB L_{den}) may be a poor characterization of wind turbine noise and may limit the ability to observe associations between wind turbine noise and health outcomes.”

It is therefore considered that the WHO recommended average noise exposure level should not currently be applied as a target noise criterion for existing or proposed wind farms in Ireland.

In relation to the various observations on health effects it is noted that these issues are addressed in section 13.4.2.3 of the EIAR. This section of the EIAR concluded:

“The peer reviewed research outlined in the preceding sections supports that there are no negative health effects on people with long term exposure to wind turbine noise. Please refer to Chapter 5 of the EIAR for further details of potential health impacts associated with the Proposed Development.”

4.2 Amplitude Modulation

Amplitude modulation has been raised as a concern in several of the third-party submissions.

AWN can confirm that the information provided in Section 13.4.2.2.2 of the submitted EIAR presents a discussion on the issue of Amplitude Modulation noise associated with the operation of wind turbines.

In addition, the following comments are provided to confirm how the operator would address AM during the operational phase of the Proposed Development, if AM were to arise at a noise-sensitive location.

In the event of a legitimate complaint which indicates potential amplitude modulation (AM) associated with turbine operation, the operator will employ a qualified acoustic consultant to assess the level of AM. This assessment will be undertaken in accordance with the methods outlined in the Institute of Acoustics (IOA) Noise working Group (Wind Turbine Noise) Amplitude Modulation Working Group (AMWG) namely, *Institute of Acoustics IOA Noise Working Group (Wind Turbine Noise) Amplitude Modulation Working Group Final Report: A Method for Rating Amplitude Modulation in Wind Turbine Noise* (9 August 2016) or subsequent revisions.

The measurement method outlined in the IOA AMWG document, known as the ‘Reference Method’, will provide a robust and reliable indicator of AM and yield important information on the frequency and duration of occurrence, which can be used to evaluate different operational conditions.

4.3 Infrasound and Low Frequency Noise

The issue of infrasound and low frequency noise has been raised in the third-party submission documents.

AWN can confirm that the information provided in Section 13.4.2.2.1 of the submitted EIAR presents a discussion on the issue of low frequency noise and infrasound associated with the operation of wind turbines. The following is reiterated for clarity as per Section 13.4.2.2.1 of the EIAR:

“In relation to Infrasound, the following extract from ‘EPA document Guidance Note for Noise Assessment of Wind Turbine Operations at EPA Licensed Sites (NG3)’ is noted here:

“There is similarly no significant infrasound from wind turbines. Infrasound is high level sound at frequencies below 20 Hz. This was a prominent feature of passive yaw “downwind” turbines where the blades were positioned downwind of the tower which resulted in a characteristic “thump” as each blade passed

through the wake caused by the turbine tower. With modern active yaw turbines (i.e. the blades are upwind of the tower and the turbine is turned to face into the wind by a wind direction sensor on the nacelle activating a yaw motor) this is no longer a significant feature.”

With respect to infrasonic noise levels below the hearing threshold, the World Health Organisation (WHO) document “Community Noise” has stated that:

“There is no reliable evidence that infrasounds below the hearing threshold produce physiological or psychological effects.”

AWN confirm that the information provided in Section 13.6.3.5 of the submitted EIA presents an up-to-date discussion on the issue of infrasound and low frequency noise associated with the operation of wind turbines, accordingly this issue has been addressed in the application documentation which notes as follows (EIA Page 11-9 refers).

“In the unlikely event that an issue on low frequency noise is associated with the proposed development, it is recommended that an appropriate detailed investigation be undertaken. Internal measurements are recommended and due consideration should be given to the guidance contained in Appendix VI “Low Frequency Noise” of the EPA document “Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)” which are in-turn based on the threshold values outlined in the Salford University document “Procedure for the assessment of low frequency noise complaints”, Revision 1, December 2011.”

The Applicant has confirmed that the above will be implemented in full in the event of any such issues arising.

Additional responses are presented below in response to the third-party submissions.

Comment on Claims by Mariana Alves-Pereira

A number of the third-party submissions make reference to a presentation by Mariana Alvez-Pereira on her claims of serious negative health effects associated with wind turbine noise, in particular, infrasound. Having reviewed the presentation document included within the submissions and based on our knowledge of the claims made by Mariana Alvez-Pereira, AWN would note the distinct lack of empirical data supporting such claims.

The following comments are noted from an article published in the Institute of Acoustics Bulletin¹⁰ by Dick Bowdler FIOA. Mr. Dick Bowdler is a Chartered Engineer, a Chartered Physicist and one of the original members of the Institute of Acoustics when it was founded in 1974. Mr. Bowdler regularly works on behalf of residents objecting to wind energy development and Councils in the UK and Ireland. The article was composed following his attendance at a similar presentation held in Glasgow on 22nd September 2017, one of the speakers at this conference was Mariana Alvez-Pereira. The following extracts are taken from the article that was published in the Institute of Acoustics Bulletin:

“Organised by some objectors in Scotland, it sought to counter the “misinformation” put out by governments, health services, acousticians, and the wind industry world-wide. The misinformation we were told they disseminate is

¹⁰ Wind turbine noise: the search for an alternative truth Acoustics Bulletin Vol 42 No 6 November/ December 2017, Institute of Acoustics

that there no evidence that infrasound causes a wide range of illnesses in humans and animals and, what is more, the probability of there being any causal effect is vanishingly small. The seminar was started by Melvin Grosvenor of the Independent Noise Working Group explaining how members of the Establishment all over the world tell us that there are no health effects from infrasound from wind turbines. People here, he said, will tell you differently because they are ill from infrasound. There was a conspiracy to hide the real facts which he likened to cover-ups in the past of asbestos, the radium girls, tobacco, Thalidomide and Primodos.”

In relation to the presentation by Mariana Alvez-Pereira the article says:

“Finally, Mariana Alvez-Pereira, a specialist in vibro-acoustic disease, explained how in a sound field we were bombarded with mechanical forces, and she demonstrated this by punching her body with her fist.”

“Readers of this publication will have noticed that certain basic technical details had been glossed over during the meeting. There was no evidence that dead animals were killed by infrasound – no post mortem.”

“Mariana’s example of mechanical forces pounding the body is right in principle though the fist is something of an exaggeration. In reality, it is more like a gentle fanning of the face with a sheet of paper”

“It is a fact that turbines, like most mechanical things, produce infrasound. It is also a fact that some people living near turbines are ill. The biggest scientific flaw to the evening was that not one shred of evidence was put forward to show any causal link between the two.”

The following text is taken directly from pages 123-124 of the *Australian Administrative Appeals Tribunal Decision into the effects, if any, of ILFN on human health, waubra-and-acnc-decision*:

“Professor Mariana Alves-Pereira

398. Professor Alves-Pereira provided a written report, dated 28 April 2016, 278 and also gave oral evidence during the hearing.

399. We found the evidence of Professor Alves-Pereira to be of limited assistance except to the extent that it was consistent with that of other experts. However, her evidence sharply diverged from that of the other experts in two key respects.

400. Based on very limited studies, she postulated the existence of a phenomena known as “vibroacoustic disease” due to exposure to low-frequency noise, the “hallmark” of which was the thickening of the pericardium. She expressed the opinion that this thickening could only be detected through the use of forms of investigation such as echocardiography or ultrasound imaging.

401. As she acknowledged, Professor Alves-Pereira is not a medical doctor and her opinion as to the existence of this disease and its cause was not supported by any of the other experts, including those with medical qualifications. In these circumstances, we do not accept her evidence as to the existence of vibroacoustic disease being potentially related to the emissions of wind farms.

402. Professor Alves-Pereira also postulated that the phenomenon of noise annoyance was attributable to prior excessive exposure to infrasound and low-frequency noise resulting in a fusing of the cochlear cilia. Again, this theory was not supported by any of other experts and, indeed, Professor Alves-Pereira conceded that it could only be proved through extensive autopsies combined with detailed histories of the deceased's lifetime noise exposure.

403. On the evidence before us, we do not accept that the phenomena of noise annoyance is explained, in whole or in part, by prior excessive exposure to infrasound and/or low frequency noise.

404. Having regard to these and other matters, we are not prepared to attach much weight to the evidence of Professor Alves-Pereira.”

4.4 Wind Turbine Syndrome

There is general reference to “Wind Turbine Syndrome” within the third-party submissions. In response to issue of “Wind Turbine Syndrome we refer the following published research.

Research by Simon Chapman and Fiona Crichton in *Wind Turbine Syndrome, A communicated disease*, published by the Sydney University Press in 2017, presents critical review of the evidence for Wind Turbine Syndrome. In this book, they present evidence that Wind Turbine Syndrome has evolved through dissemination of false claims accessed via the media or disseminated by anti-windfarm campaigners.

Their hypothesis is that the belief that wind turbine noise can impact on health may in turn generate anxiety in some individuals causing them to needlessly worry and fear. One of the most interesting findings of this research is that the international pattern of complaints is most frequently reported in English speaking countries, the following text is taken from this book:

“The ‘individual susceptibility’ argument faces its biggest test when we look at the international pattern of complaints. It has been frequently noted that complaining about wind turbines is very obviously an Anglophone phenomenon. Modern multi-megawatt wind turbines have operated since 1978 in the USA and Europe. Today, there are an estimated 314,000 turbines in operation globally. European nations with windfarms include Belgium, Cyprus, Denmark, England, France, Germany, Greece, Ireland, Italy, Lithuania, the Netherlands, Poland, Portugal, Romania, Scotland, Spain, and Sweden. The turbines are often located very near cities, towns and villages (see Figures 3.1 and 3.2), thus exposing a huge number of people across Europe to their putative sickening sound emissions on a daily basis. Anyone who has spent time in these nations will have seen many of them. Yet windfarm health complaints have nearly all occurred in English-speaking nations. In Canada, parts of English-speaking Ontario have experienced many complaints while neighbouring Francophone Quebec sees little opposition. In Australia, complaints have been concentrated around farms targeted by anti-windfarm groups, suggesting the phenomenon is a ‘communicated disease’.”

It is AWN's opinion that these claims are not supported by scientific evidence, and we refer again to Section 13.4.2.2 of the submitted EIAR which presents a discussion on sleep disturbance and human health in relation to wind turbines. It should be noted that the relevant Guidance considered as part of this assessment have been development with cognisance of guidelines published by the World Health Organisation (WHO).

4.5 Quality of Background Noise Surveys

Section 13.5 of the EIAR outlines the baseline noise monitoring that was completed for the noise assessment outlined therein. This stage of the assessment was to determine typical background noise levels at representative NSLs surrounding the development site. The background noise survey was conducted through installing unattended sound level meters at six representative locations in the surrounding area.

All measurement data collected during the background noise surveys has been carried out in accordance with ETSU-R-97, IOA GPG and accompanying *Supplementary Guidance Note 1: Data Collection* (2014).

The noise monitoring locations were identified by preparing a preliminary noise model contour at an early stage of the assessment. Any locations that fell inside the predicted 35 dB L_{A90} noise contour was considered for noise monitoring in line with current best practice guidance outlined in the IOA GPG. The selection of the noise monitoring locations was informed by site visits and supplemented by reviewing of aerial images of the study area and other online sources of information (e.g., Google Earth).

The siting of noise measurement equipment in line with the IOA GPG was difficult due to access issues in the area e.g., reluctance of residents to participate in the background noise survey or those who did participate preferring that the equipment was not visible to the public. As a result, professional judgement was used to choose suitable proxy locations at properties and lands that were agreeable to participate in the background noise survey. The monitoring locations were deemed representative, as per the IOG GPG, of *“typical ‘low’ levels likely to be experienced in the vicinity of a dwelling (or group of dwellings if the measurements are intended to be applied to more than one dwelling).”*

As per the IOA GPG, due to access issues:

“The overriding consideration is that it can reasonably be claimed, from inspection and observation, that there are no other suitable noise-sensitive locations, in the vicinity of any selected location and close to a dwelling, where background noise levels would be expected to be consistently lower than the levels at the selected position. This is a matter of judgment: the objective is to measure ‘typical’ or ‘indicative’ not ‘absolute lowest’ levels of background noise (which could only be determined by extended measurements at a large number of locations over a long period which is neither necessary nor practicable).”

As noted in SGN 2:

The choice of survey positions is often an area of dispute between those proposing a wind turbine development and those opposing it: with claims made that background noise levels at the selected locations are higher than at other positions for which the actual measurement position is a proxy, which leads to higher noise limits and therefore disadvantages local residents.

All proxy measurement locations used in this project are considered typical of the lowest background noise levels as the measurement locations were sited further from the dominant noise sources e.g., road traffic noise, than the other NSLs in the area. This is a conservative scenario for the noise assessment as the criteria are based on the lowest background noise levels, and conversely is the best-case scenario for the NSLs in the area.

4.6 General Comments on MAS Report

AWN has reviewed a copy of the Noise Impact Report contained in a submission from Paddy Massey, report reference Lyrenacarriga Wind Farm Assessment and review of noise impact from proposed wind farm dated 4 March 2021 prepared by MAS Environmental (MAS Report).

The conclusions reached in the MAS Report are typically based on a difference of professional opinion and in some instances the use of alternative assessment methodologies.

As stated in Section 13.4.2.1 of the EIAR and confirmed in Section 2.0 of this document, the assessment methodology adopted in Chapter 13 of the in the EIAR for the assessment of wind turbine noise is in full accordance with the latest best-practice methods.

Some additional and specific items raised within the MAS report are addressed in the following sections.

4.6.1 Amplitude Modulation

Section 3.34 of the MAS Report states that there is no accepted methodology for predicting AM on a proposed wind farm site, while on the other hand, Section 7.32 states, there are strong indicators that AM will arise at the proposed development. It is noted that there are no calculations presented in the MAS Report to support the latter statement, and if AM were to arise, as claimed, there is no assessment or statement to quantify the significance of AM, the duration, nor the frequency of occurrence.

The review of AM presented in Section 7.0 presents examples to explain the features of AM. The review does not refer to the adopted assessment methodology or present details of the measurement context, rather the MAS Report presents four marked-up graphs showing noise measurement taken over very short durations. The information presented does not support the claim that AM will arise from Lyrenacarriga Wind Farm.

AWN confirm that the information provided in Section 13.4.2.2.2 of the submitted EIAR and Section 4.2 address the potential issue of Amplitude Modulation in respect of the proposed development.

4.6.2 Background Noise Monitoring Locations

Please refer to Section 4.5 of this document where this item is addressed.

4.6.3 Selection of Lower Threshold Level

The applicable guidelines for the proposed development are presented in Section 13.4.2.1 of the EIAR.

The WEDG06 states:

“However, in very quiet areas, the use of a margin of 5 dB(A) above background noise at nearby noise sensitive properties is not necessary to offer a reasonable degree of protection and may unduly restrict wind energy developments which should be recognised as having wider national and global benefits. Instead, in low noise environments where background noise is less than 30 dB(A), it is recommended that the daytime level of the $L_{A90, 10min}$ of the wind energy development be limited to an absolute level within the range of 35 – 40 dB(A).”

The selection of a lower threshold of 40 dB L_{A90} is fully in accordance with the applicable guidelines for the Proposed Development.

A rationale for this justification is presented in Section 13.6.3.1 of the EIAR. Additional comments are presented below to support the justification for the lower threshold.

It is very common in Ireland for wind turbine developments of a similar scale and in a similar environment to be conditioned with lower threshold noise limit of 40 dB L_{A90} , in some cases 43 dB L_{A90} has been imposed. Examples of some wind farm developments that have been permitted by An Bord Pleanála with operational turbine noise limits conditioned with a lower threshold of 40 dB L_{A90} are given below.

- Coole Wind Farm (Planning Ref. ABP-300686-18).
- Derrinlough Wind Farm (Planning Ref. ABP-306706-20).
- Clooncreen Wind Farm (Planning Ref. ABP-308171-20) (43 dB L_{A90} lower threshold conditioned).
- Meenbog Wind Farm (Planning Ref. ABP Ref: PL14.303592).

It is noted that on page 114 of the Cork County Council Planning report the suggested planning condition for noise states a lower threshold of 40 dB L_{A90} in low noise environments where background noise is less than 30 dB(A).

4.6.4 Clarification on statements made in Section 13.6.3.1 of the EIAR

The following statement is contained in Section 13.6.3.1 of the EIAR:

“The EPA document ‘Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)’ proposes a daytime noise criterion of 45 dB(A) in ‘areas of low background noise’. The proposed lower threshold here is 5 dB more stringent than this level.”

AWN acknowledges and accepts that there is a difference in the two parameters, L_{Aeq} and L_{A90} . The turbine noise limits are couched in terms of the L_{A90} parameter while the NG4 daytime limit is couched in terms of the L_{Aeq} . The accepted difference between the L_{Aeq} and L_{A90} for wind turbine noise assessments is 2 dB, e.g., 45 dB L_{Aeq} equates to 43 L_{A90} . This approach infers a 3 dB difference when accounting for difference parameters between the NG4 limits and the WEDG06 limits proposed in the EIAR Chapter. AWN accepts the technical point presented in the MAS Report however, the proposed lower threshold of 40 dB L_{A90} is still supported by this fact that the proposed lower threshold criterion for wind turbine noise is 3 dB more stringent than the equivalent daytime noise limit for areas of low background noise outlined in NG4.

AWN does not agree with the suggestion in the MAS Report that the NG4 comparison is taken out of context as it does not consider the evening and night-time limits stipulated in NG4. The applicable guidelines, WED06, present clear guidance for night time limits for wind turbine noise. The comparison to the NG4 daytime limits for areas of low background noise is presented in the EIAR to inform an appraisal of the selection of an appropriate daytime lower threshold turbine noise limit as required by the WEDG06 guidelines.

4.6.5 Significance of the Impact

AWN can confirm that the information provided in Section 13.7.3.1.1 of the submitted EIAR presents a description of the significance of the effects of the operation of the proposed wind turbines, the EIAR states:

“The predicted noise levels associated with the Proposed Development will be within best practice noise criteria curves recommended in Irish guidance ‘Wind Energy Development Guidelines for Planning Authorities it is not considered that a significant effect is associated with the development.

While noise levels at low wind speeds will increase due to the development and specifically the operation of the turbines, the predicted levels will remain low, albeit new sources of noise will be introduced into the soundscape.

With respect to the EPA’s criteria for description of effects, in terms of the operational phase, the potential worst-case associated residual effects at the nearest NSLs associated with the various elements of the operational phases are described below.

The predicted residual operational turbine noise effects are summarised as follows at the closest NSLs to the site:

<i>Quality</i>	<i>Significance</i>	<i>Duration</i>
<i>Negative</i>	<i>Moderate</i>	<i>Long-tern</i>

The above effect should be considered in terms that the effect is variable and that this assessment considers periods of the greatest potential effect.

For most of the locations assessed here the effect of the operational turbines are as follows:

<i>Quality</i>	<i>Significance</i>	<i>Duration</i>
<i>Negative</i>	<i>Slight</i>	<i>Long-tern”</i>

When assessing the significance of the potential noise impact the main factors that were considered are summarised below:

- The overall predicted turbine noise levels are within the applicable noise criteria outlined in the applicable guidelines WEDG06.
- A new audible source of noise will be introduced to the environment.
- The difference in the derived background noise level and the predicted turbine noise levels is variable and will change depending on the windspeed, direction and the levels of background noise at a given location.
- The difference between the derived background noise levels and the predicted turbine noise levels are typically higher at night compared to the day and this has been considered and factored into the WEDGO6 Guidelines and criteria (refer to section 13.4.2.1.1 of the EIAR).
- The issue of special noise characteristics i.e., amplitude modulation, low frequency noise, and infrasound have all been considered in Chapter 13 of the EIAR (additional commentary provided in this document).
- the above points apply to the assessment regardless of which turbine is selected within the proposed Turbine Range.

3.6.6 Wind Shear

Section 5.44 of the MAS report presents a comparison of the 10 m height measured wind speed against the 10 m height standardised wind speed. The comparison of the of the two parameters presented in the MAS Report is not relevant to the assessment presented in Chapter 13 of EIAR, or the additional assessments and results presented in this document. The 10 m height *standardised* wind speed is not a representation of the 10 m height wind speed.

The 10 m height standardised wind speed is defined in the IOA GPG as follows:

“a wind speed measured at a height different than 10 m (generally measured at the turbine hub height) which is expressed to a reference height of 10 m using a roughness length of 0.05 for standardisation purpose (in accordance with the IEC 61400-11 standard)”

Section 4.5.1 of the IOA GPG states:

“Basing the predictions on sound power data tested in accordance with the IEC 61400-11 standard (or equivalent) should mean that the wind reference used corresponds to hub height wind speeds, standardised to 10 m height using a fixed correction (see Annex A). These predictions can then be compared to background levels and/or associated noise limits derived using an equivalent wind speed reference, which will have wind shear taken into account directly”

The use of the 10 m height standardised wind speed is an industry standard to allow for comparison of wind speeds at different hub heights. In the context of the background noise levels derived in Chapter 13 of the EIAR, the assessment considers the specific hub height and the site specific wind shear.

Section 13.5.5 of the EIAR confirms the methodology adopted in the assessment of the proposed development to account for wind shear. It is confirmed that the assessment has been undertaken in full accordance with best practice guidance provided in the IOA GPG.

5.0 **RESPONSE TO ISSUES RAISED BY CORK COUNTY COUNCIL**

This section addresses key issues relating to the Noise and Vibration assessment raised in the Cork County Council Planners Report (CCCPR). The relevant comments are presented, and responses presented below.

CCCPR comment:

“The Wind Energy Guidelines outline that a maximum increase in sound of 5 dB above background noise levels in very quite [sic] areas will unduly restrict wind energy development. The Guidelines recommend that in very quite [sic] areas, i.e. where the background noise level, is less than 30 dB that the wind energy development noise is limited to a range of 35 – 40 dB. The applicant has applied the upper 40 dB(A) limit for the applicable Noise assessment set out in the EIAR. This should be further clarified and the rational explained.”

Response:

Please refer to Section 3.6.3 of this document where this issue is addressed.

CCCPR comment:

“The respective number and distances of all noise sensitive receptors within 500m, 1000m,1500m and 2000m of the turbines should be presented and quantified.”

Response:

This information is provided in Section 2.3 of the FI response main document.

CCCPR comment:

“In respect of operational phase mitigation, it is submitted as per section 13.6.3.5, that the findings of the assessment confirmed that the predicted operational noise levels will be within the relevant best practice noise criteria curves for wind farms at all but one Noise sensitive location, which is a landowner dwelling. Therefore, no mitigation measures are required. This should be clarified as this does not appear to be indicated and highlighted in Table 13.22.”

Response:

The reference to an exceedance at a landowner property is an error and the corrected text is presented below for clarification.

An assessment of the operation noise levels has been undertaken in accordance with best practice guidelines and procedures as outlined in Section 13.7.3 of this Chapter. The findings of the assessment confirmed that the predicted operational noise levels will be within the relevant best practice noise criteria curves for wind farms at all NSLs, therefore, no mitigation measures are required.



APPENDIX 5

FILVIA RESPONSE

FILVIA Report

Lyrenacarriga WF





DOCUMENT DETAILS

Client: **RWE**

Project Title: **Lyrenacarriga WF**

Project Number: **170749-e**

Document Title: **FI LVIA Report**

Document File Name: **RFI LVIA Report D4 - 2022.08.29 - 170749e**

Prepared By: **MKO**
Tuam Road
Galway
Ireland
H91 VW84



Planning and
Environmental
Consultants

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1. RFI – LYRENACARRIGA LVIA INPUT

1.1 Introduction

The following sections address the individual (A, B, and C) points raised by An Bord Pleanála in their request for further information in relation to landscape and the visual impact on receptors. Points A, B, and C are addressed separately below in text, with reference to a large number of additional photomontages produced (as requested) and assessed separately in a number of appendices accompanying this written submission. The photomontages themselves can be seen in Appendix 1 – Photomontage Booklet.

1.1.1 Statement of Authority

MKO has developed extensive expertise and experience over the last 15 years in the Landscape and Visual Impact Assessment of a range of projects, including residential developments, quarries, road schemes, wind energy developments and a range of other projects.

The following sections were written by Jack Smith and Jack Workman. Jack Smith M.L., MSc., is a Landscape and Visual Impact Professional. He is an Environmental Scientist and Landscape and Visual Impact Assessment (LVIA) specialist with MKO. Jack is an Affiliate member of the British Landscape Institute and holds membership with the Landscape Research Group. Jack's primary role at MKO is producing the LVIA chapter of EIA reports.

Jack Workman, a Technician Member with the British Landscape Institute (TMLI), is the Landscape & Visual Team manager at MKO, he is an Environmental Scientist and Landscape and Visual Impact Assessment (LVIA) specialist. Jack's primary role at MKO is producing the LVIA chapter of EIA reports for large infrastructure developments. Jack holds an MSc. in Coastal and Marine Environments and a BSc. In Psychology, membership with the Landscape Research Group, as well as membership with the Chartered Institute of Water and Environmental Management.

1.1.2 Range of Turbine Dimensions Assessed

The dimensions presented below are the range of hub height, blade length and overall tip height assessed within differing chapters of this EIAR and constitute a 'reasonably limited range':

- Turbine Tip Height – 150m
- Hub Height – Maximum height 93.5m, Minimum height 83.5m
- Blade Length – Maximum length 66.5m, Minimum length 56.5m

As outlined further below, the entire range of turbines was fully assessed using a number of photomontages comparing an alternative turbine configuration. Irrespective of which combination of hub height and blade length within the range outlined above is installed on site, the significance of residual landscape and visual effects will not be altered. Regardless of whichever configuration of turbine components is installed, the Tip Height of the turbines will be 150m. A blade length of 56.5m and a hub height of 93.5m was considered throughout the original EIAR assessment and is a representative illustration of the Proposed Development on the basis of professional judgement and on consideration of the range of turbines which could be installed. This combination of blade length and hub height (Maximum Hub Height and Minimum Blade Length, 150m Tip Height) has been identified as the most representative for assessment, on the basis that the greatest extent of the entire turbine structure (blades and tower) would potentially be visible from the viewpoints assessed in the EIAR. This turbine configuration (blade length of 56.5m and a hub height of 93.5m) of the reasonably limited range is termed as the 'Highest Hub and Shortest Blade':

- **Highest Hub and Shortest Blade** – All 15 No. Viewpoints.
 - Maximum Tip Height – 150 metres
 - Maximum Hub Height – 93.5 metres
 - Minimum Blade Length – 56.5 metres

Irrespective of which combination of hub height and blade length within the range outlined above is installed on site, the significance of residual landscape and visual effects will not be altered. However, for the avoidance of doubt, an alternative turbine configuration of the longest blade and lowest hub is presented for three selected viewpoints included in the photomontage booklet accompanying this document, this configuration is termed ‘Lowest Hub and Longest Blade’. The viewpoints selected are representative of short-range views (viewpoint 16 <1.5 km from the Proposed Development), and medium-range views (viewpoints 20, and 26 <6km from the Proposed Development). The photomontage assessment tables for these viewpoints contained in Volume 2 Photomontage Booklet include a comment addressing the alternative turbine configurations and confirm that the turbine configuration ultimately installed on site will not alter the assessment of residual visual effects. The following summarises the ‘Lowest Hub and Longest Blade’ configuration that is presented:

- **Lowest hub and Longest Blade** – 3 Photomontage Viewpoints
 - Maximum Tip Height – 150m
 - Minimum Hub Height – 83.5 metres
 - Maximum Blade Length – 66.5 metres

Irrespective of which combination of hub height and blade length within the range outlined in this application is installed on site, the significance of residual landscape and visual effects will not be altered as set out in Table 12-21 of the original EIAR.

1.2

Point A

Point A of the Request for Further Information states:

“A) You are requested to provide a number of additional photomontages from viewpoints which represent the local community and from a location to the east of the development which represents the impact on the wider landscape along the Blackwater River particularly in the vicinity of structures of national heritage importance. A photomontage to the south of Tallow along the R627 should also be provided. A thorough viewpoint assessment of the additional viewpoints is also required.”

This point is further broken down in the following sections which deal separately with

- the local community,
- the wider landscape along the Blackwater River,
- and the R627 Regional Road south of Tallow.

These locations and areas were visited during a site visit conducted on 17th June 2022, and photomontages have been produced from various locations (as requested) and are used to inform the discussion presented below. It is also noted that a large number of Viewpoints have now been included in the landscape and visual impact assessment conducted in the original EIAR together with those included in this response to a request for further information. These include images that were not produced as fully rendered photomontages as there was limited visibility. The locations of all of these image capture locations can be seen below in Figure 1-6.

1.2.1

The Local Community

In relation to *“the local community”* a number of additional photomontages were captured which are comprehensively assessed in full in Appendix 1 which accompanies this report. The locations of these

are shown on Figure 1-1 below, and the photomontages themselves can be seen in Volume 2 – Photomontage Booklet. The following section should be read in conjunction with the Photomontage Booklet and Appendix 1.

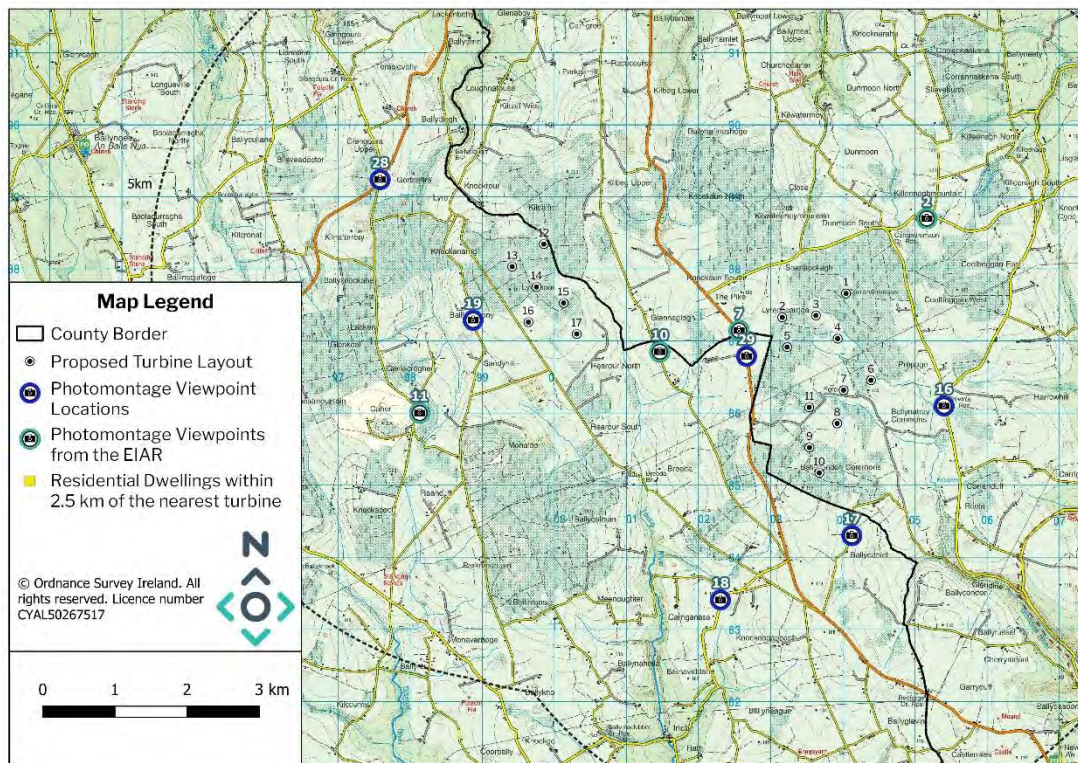


Figure 1-1 Local Community Photomontage Locations

There are now a total of 11 photomontages (between the original EIAR and the additional photomontages included in this response to a request for further information) representing the visual effects of the Proposed Development from locations representing the local community. These show representative views of the Proposed Development from multiple orientations and perspectives. As these photomontages are assessed in full in the accompanying appendix (Appendix 1) containing the viewpoint assessment tables, the following section discusses residential visual amenity in a general sense. It is noted however, that there are no Significant residual visual effects deemed to arise in relation to residential receptors as a result of the Proposed Development.

Given the siting of the Proposed Development within an elevated area of commercial forestry, the turbines are often well screened from the closest residential receptors, as the commercial forestry often screens the proposed turbines from view even for receptors living in close proximity to the Proposed Development. An example of this type of screening is shown below in Plate 1-1, where the commercial forestry seen in the left-hand side of the view will likely screen the vast majority of the turbines from view, despite their proximity to this location (closest turbine is located approximately 750m away). In the event of the felling of any sections of this forestry, there may potentially be views from residential receptors discussed here although it is noted that the landscape will remain that of a commercial forestry site and that any views will not have a Significant impact on residential visual amenity.

It is noted that for all the Viewpoints and residential receptors represented by these, discussed below, the distance from the closest turbines in relation to the properties adjacent to these viewpoints is compliant with the required set-back distances set out under the relevant guidelines (namely the 4 times tip height set-back distance prescribed by the Draft Revised Wind Energy Development Guidelines (2019, DoHPLG) and the minimum 500m set-back distance prescribed by the Wind Energy Development Guidelines (2006, DoEHLG)).



Plate 1-1 View south-east from just outside a residential property located north-west of turbine T13

Locations were also identified where there were open views in the direction of the Proposed Development, with a focus on locations requested by the Board and the considerations highlighted by Waterford County Council and Cork County Council, and these were selected as Photomontage Viewpoint Locations. The following discussion is intended to supplement Section 12.8.3.5 from the EIAR which discusses the visual effects on residential properties between the two turbine clusters in some detail.

1.2.1.1 Views from the East and South of the Eastern Cluster

Viewpoints 16, 17, and 18 are located to the east, south-east, and south-west of the eastern cluster of turbines, respectively. Residual visual effects were deemed to be 'Moderate' for Viewpoints 16 and 17, where in general, the distance from the viewpoints provide a degree of separation from the proposed turbines and the presence of large tracts of commercial forestry provides a perspective for this separation from the residential properties represented by these viewpoints. While there will be a large degree of change within the views shown in these Photomontages, they will not amount to a Significant effect in relation to residential visual amenity. From Viewpoint 16, the proposed turbines are viewed as a visually coherent array across the landscape in less than a 90 degree field of view. From Viewpoint 17, most of the proposed turbines are obscured from view by the intervening topography and comprises a relatively small horizontal extent of the view. In both instances, the proposed turbines are viewed within a low value landscape of commercial forestry.

Viewpoint 18 represents a relatively large grouping of residential properties to the south-west of the eastern cluster. This location was selected as it was likely to show one of the most open views towards the Proposed Development from this area, however, it was not produced as a full photomontage for inclusion in the booklet due to the very limited visibility of the proposed turbines from this location. An overlaid wireframe image (early-stage photomontage) showing the positioning of the proposed turbines in this view is shown below in Figure 1-2.



Figure 1-2 View north-east from Viewpoint 18, where the proposed turbines can be seen to be almost entirely screened by the intervening vegetation in the landscape

Overall, views from the local community towards the Proposed Development from the east and south of the eastern cluster are generally limited as a result of the highly vegetated farmland landscape and the screening this provides from properties in these areas. Two photomontages were produced from locations representing residential receptors in close proximity to the Proposed Development from various perspectives. In both cases Significant visual effects were deemed not to arise. In all cases the addition of the Proposed Development into the view does not substantially impact any key sensitive scenic landscape features in view, and the turbines are always viewed within a landscape of commercial forestry, a landscape already subject to large-scale human modification. No Significant effects are deemed to arise in relation to residential visual amenity in the locations discussed here, or elsewhere.

1.2.1.2 Views from the West of the Western Cluster

Viewpoint 19 is located along a local road to the west of the western cluster, adjacent to one of the residential properties located closest to the western cluster from this perspective. It is noted that from locations further north and south along this road (which also have residential properties located nearby), visibility in the direction of the Proposed Development is substantially screened by the commercial forestry that lies in the intervening space. A residual visual effect of 'Moderate' was deemed to arise at this Viewpoint. It is noted that in the viewpoint assessment table for Viewpoint 19 (contained in Appendix 1), that the topography provides a degree of separation from the Proposed Development. The view from this location is a short-range view over an agricultural field and is not a highly valued or scenic view. Again, it is worth noting that the relevant guidelines (namely the 4 times tip height set-back distance prescribed by the Draft Revised Wind Energy Development Guidelines (2019, DoHPLG) and the minimum 500m set-back distance prescribed by the Wind Energy Development Guidelines (2006, DoEHLG)) are adhered to.

The landscape in view from this orientation (views from the west of the western cluster) is a landscape suitable for the Proposed Development as a low value commercial forestry site. Overall, views from the local community towards the Proposed Development from the west of the western cluster are generally limited as a result of the highly vegetated farmland landscape and the presence of large tracts of commercial plantation forestry, and the screening this provides from properties in these areas. In all cases the addition of the Proposed Development into the view does not substantially impact any key sensitive scenic landscape features in view, and the turbines are always viewed within a landscape of commercial forestry, a landscape already subject to large-scale human modification. In this regard the Proposed Development Site is a suitable site in terms of landscape capacity to accommodate the Proposed Development and there are no Significant effects arising in relation to residential visual amenity in the locations discussed here, or elsewhere.

1.2.1.3 Conclusion

Residential visual amenity is discussed further below in this report, with reference to specific concerns highlighted by Cork and Waterford County Councils. The discussion of these concerns highlighted often refer to this section to illustrate that residential amenity has been fully and comprehensively assessed in some detail, both within the original EIAR (Section 12.8.3.5) and within this supplemental section.

Overall, the impact on residential visual amenity is not considered to be Significant in relation to the Proposed Development. In general, the proposed turbines are well set-back from local residences and are compliant with the minimum set-back distances from all residences in the local community (see Section 1.4.6 below). Views towards the site from those residential receptors located closest to the Proposed Development are not of a high scenic value, given that they are views towards large tracts of commercial forestry, often separated by topographical features, such as valleys, slopes, or hills.

1.2.2 Wider Landscape Along the Blackwater River

In relation to the wider landscape along the Blackwater River the request for further information from An Bord Pleanála (ABP) which states that additional photomontages are requested *“from a location to the east of the development which represents the impact on the wider landscape along the Blackwater River particularly in the vicinity of structures of national heritage importance.”*

As requested by the Board, several photomontages have been produced to represent the impact on the wider landscape along the Blackwater River in the vicinity of important national heritage structures, and these are included in the Photomontage Booklet accompanying this document. However, it is important to note that these are not necessarily representative of all views and visibility of the Proposed Development within this particular landscape. As discussed below, the geographical characteristics of this landscape visually separates the Proposed Development from valuable landscape receptors and valuable scenic amenity in the Blackwater Valley. This point cannot be made more clearly than by looking at the Zone of Theoretical Visibility (ZTV) maps below. The ZTV mapping is highly informative, showing a huge proportion of the Blackwater valley to have no theoretical visibility. In this regard, it is again important to note that ZTVs are very useful tools for showing locations or areas where there is unequivocally no visibility of a Proposed Wind Farm. Where a ZTV map shows theoretical visibility, this requires further investigation on the ground, and in this instance, actual visibility on the ground was found to be substantially less likely than is predicted by the ZTV mapping.

1.2.3 Geographical Landscape Context – Blackwater Valley & The Proposed Development

Figure 1-3 below shows a view north from the Dromore Viewpoint (away from the Proposed Development), with impressive views over the low flood plains surrounding the River Blackwater and River Bride to the north-west (north of the Proposed Development) and the Blackwater Valley to the north. The lowlands adjacent to these rivers form a connected rural lowland riverside landscape with a number of cultural heritage sites with theoretical visibility of the Proposed Development. These are marked on Figure 1-7 below which shows the extent of the valleys where there is no theoretical visibility. Two of these sites are also shown on Figure 1-3 below (Camphire House and Castle, and the 17th Century House at Headborough), both of which are located within the Zone of Theoretical Visibility (ZTV) but at locations close to the edge of this zone, as seen on Figure 1-7 below. These sites, and a number of other cultural heritage sites identified within the ZTV, are discussed below along with a discussion of the impact on the wider landscape along the Blackwater River. This discussion is accompanied by Photomontages and imagery where appropriate to clarify the levels of visibility of the Proposed Development from these sites and at various locations in the Blackwater Valley.

The landscape area on display in Figure 1-3 (and the Blackwater Valley in general) is a landscape with high levels of scenic amenity, attributable to the River itself and the surrounding lowlands. The following

section will demonstrate that visibility of the Proposed Development is greatly constrained from these areas, with turbines limited to the backgrounds of views where visibility does occur. This is demonstrated, for example, by a comparison of Figure 1-3 and Figure 1-4, where the Proposed Development does not interfere with the primary scenic views of the river valleys and cultural heritage sites and is well sited in relation to avoidance of potential impacts on the “*wider landscape of the Blackwater River*”.

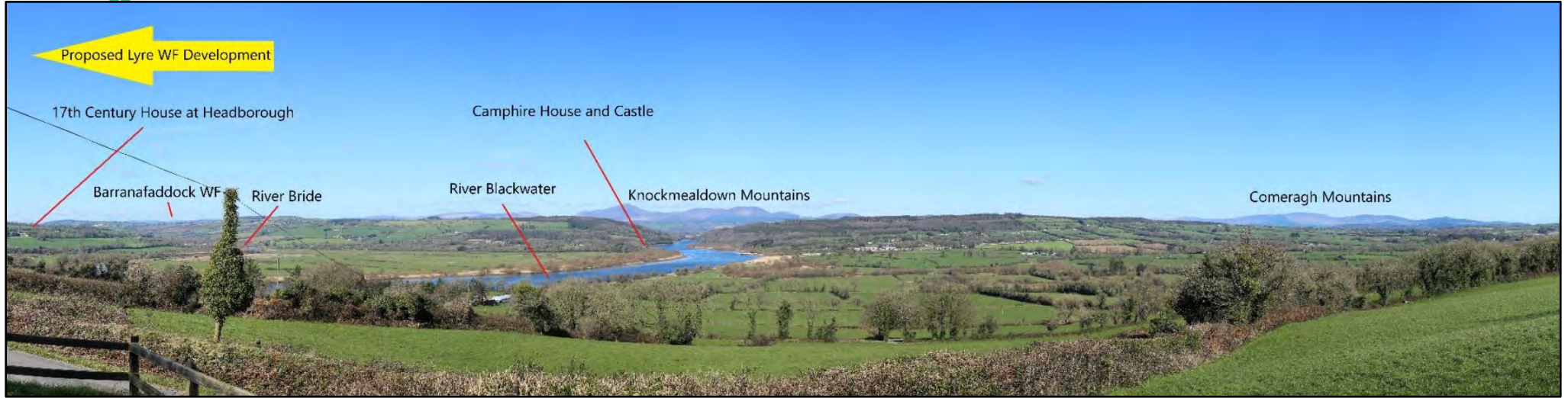


Figure 1-3 View north from the Dromore Viewpoint over the Blackwater Valley and surrounding landscape

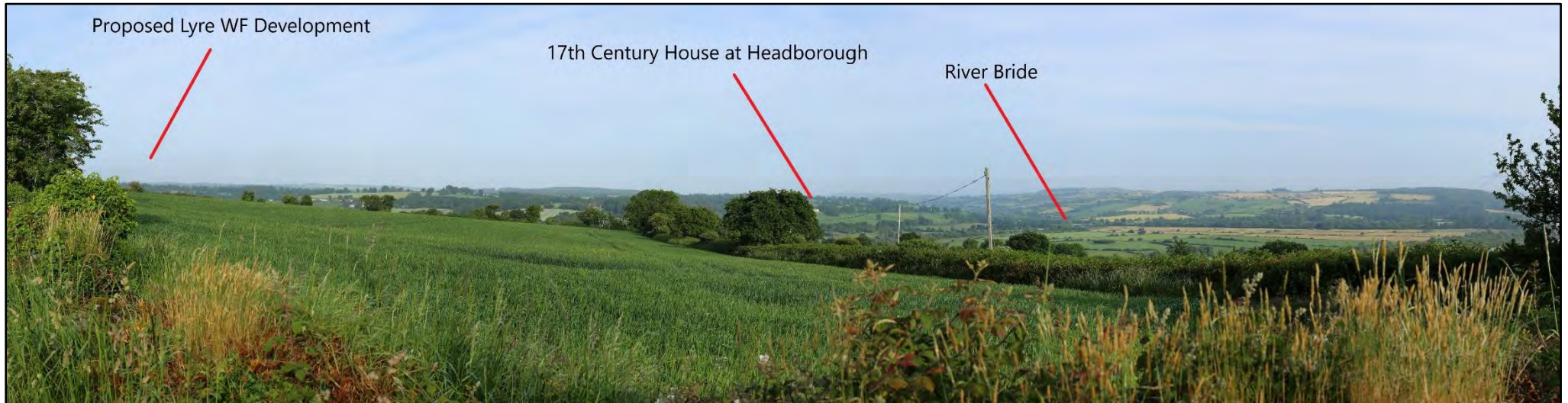


Figure 1-4 View south from the Dromore Viewpoint over the Blackwater Valley and surrounding landscape

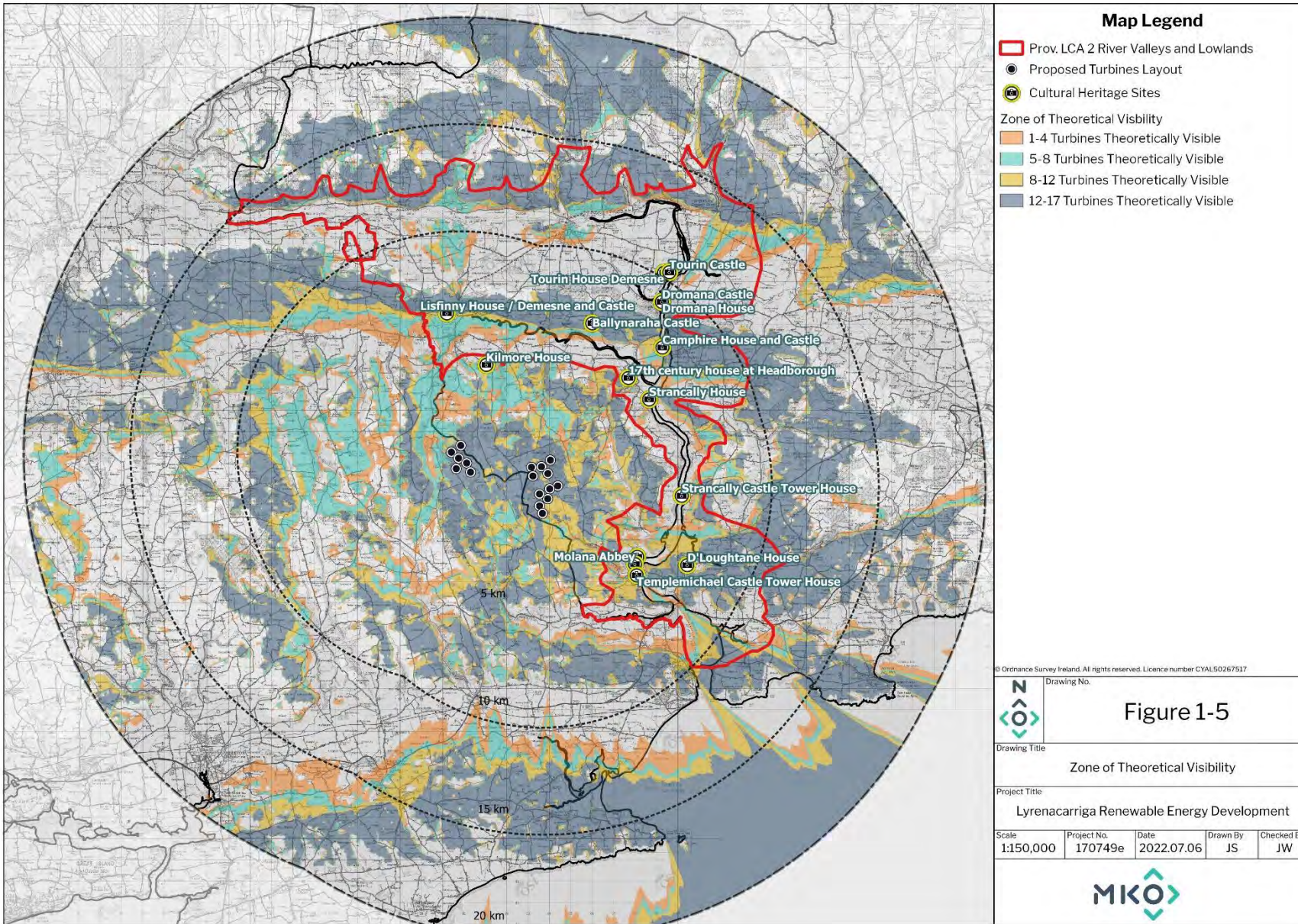


Figure 1-5 Zone of Theoretical Visibility and Cultural Heritage Sites

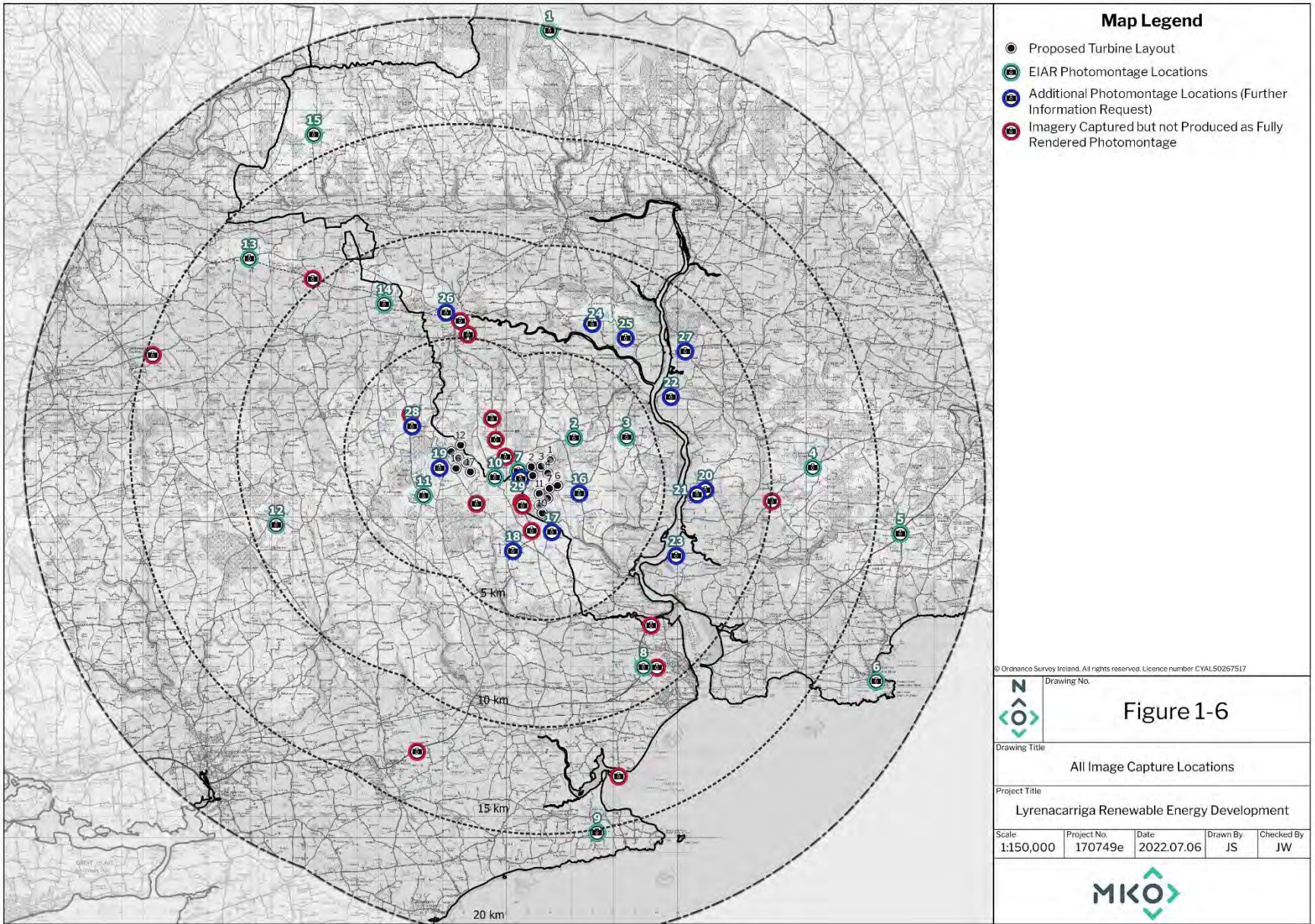


Figure 1-6 All viewpoint locations where imagery was captured over the course of the EIA and this response to the request for further information

ZTV Mapping

Figure 1-7 shows an inverse of a traditional ZTV map (such as Figure 12-11 in the EIAR and Figure 1-5 above), it indicates the extent of the Blackwater Valley and wider landscape that has no theoretical visibility (shown in green). In general, it is notable that there are large areas of the Blackwater Valley that have areas of no theoretical visibility. In particular, the areas lower in the valley and closer to the River itself can be seen to have no theoretical visibility, as the Proposed Development is screened by the intervening topography.

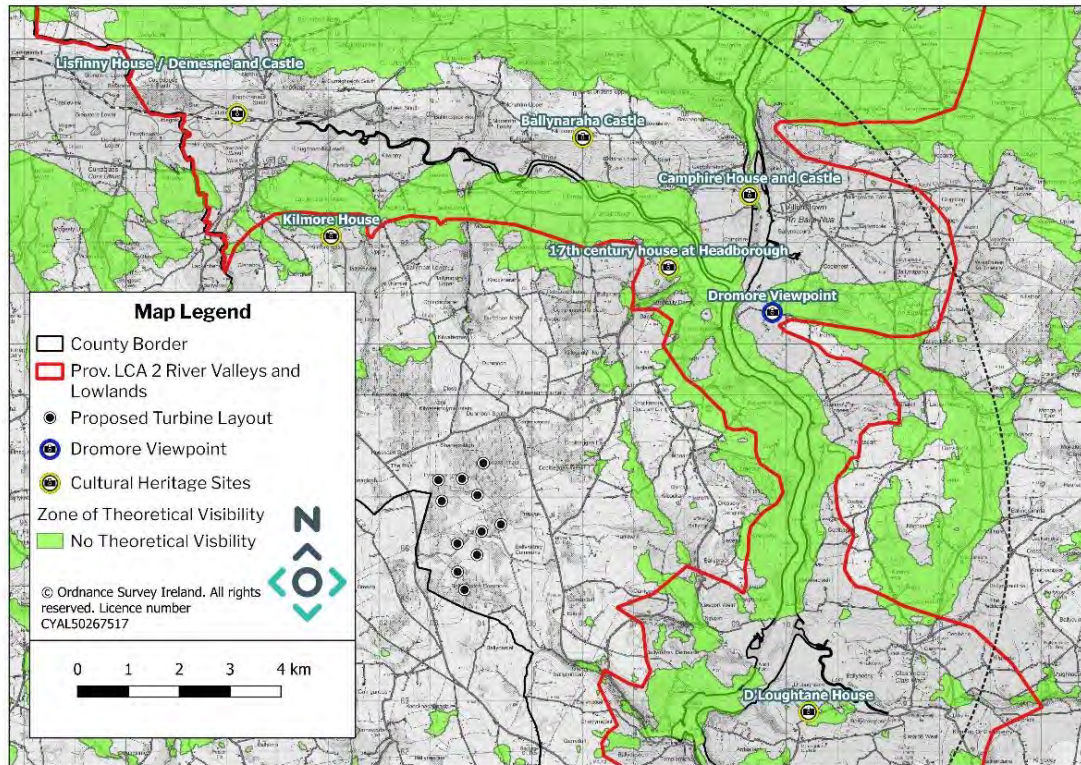


Figure 1-7 Theoretical Visibility in the Blackwater Valley

Locations of higher elevation on the valley sides generally have greater levels of theoretical visibility, and this is where the visual assessment and viewpoint selection is focused. Figure 1-8 below shows the viewpoint locations selected to represent a number of different views from the Blackwater Valley and surrounding landscape. Viewpoint locations focused on locations where open views in the direction of the Proposed Development were available, which was not always the case for the cultural heritage sites shown on Figure 1-7 above. A full viewpoint assessment table for each of these viewpoints is contained in Appendix 1 accompanying this document, and the Photomontages themselves can be seen in the accompanying Photomontage Booklet. It is noted that no Significant residual visual effects were deemed to arise in this thorough assessment of visual effects.

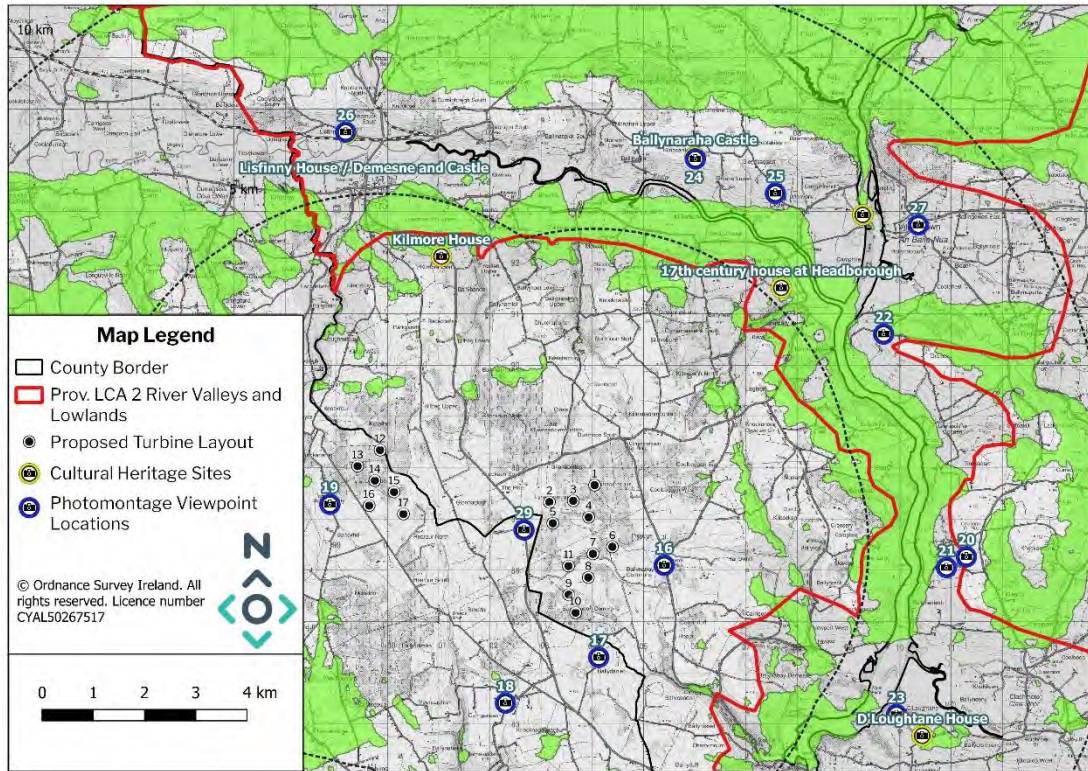


Figure 1-8 Blackwater Valley Photomontage Viewpoint Locations

Firstly, it is notable that a number of viewpoints are located close to the edge of the ZTV, along with a number of the cultural heritage sites identified, including Camphire House and Castle, the 17th Century House at Headborough, and Kilmore House. Viewpoints 20 and 21 are highlighted here to demonstrate that both viewpoints show theoretical visibility of the proposal but visual effects can be entirely different depending on the location of the view. In this instance, imagery was captured from both viewpoints as there was open visibility in the direction of the Proposed Development. Viewpoint 20 and 21 are located in very close proximity to each other but the difference in their relative elevation in comparison to the Proposed Development can substantially alter the topographical screening effect of the intervening landform and other landscape elements.



Figure 1-9 Viewpoint 34 (selected extract)



Figure 1-10 Viewpoint 35 (selected extract)

As seen from these Photomontages, locations further down the sides of the valley (i.e. Viewpoint 35) which are close to the edge of the ZTV have in actual fact, more limited visibility of the Proposed Development due to additional factors such as screening elements within the landscape (vegetation, built form, and localised undulations in topography). The point made here is that from locations such as those surrounding the particular cultural heritage sites listed above, which are located close to the edge of the ZTV, there is a large variation in actual on the ground visibility within such areas of theoretical visibility. Actual visibility was appraised during a site visit conducted on the 17th June 2022, and the likely visibility of the Proposed Development from these sites is minimal. The imagery shown below captured during the site visit demonstrates this lack of visibility from these locations.

Cultural Heritage Receptors

Camphire House and Castle

Plate 1-2 below shows a view to the south-west, from directly outside of Camphire House. Views from the site can be seen to be greatly constrained by the highly vegetated landscape. The ridgeline seen in the centre background of the view is located on the other side of the River Bride which is located in the intervening space (but is not visible from this view), the Proposed Development is located another 5 km (approx.) further beyond this ridgeline. On-site appraisals determined that it is highly unlikely that the Proposed Development will be visible from this location, as given the presence of a mature deciduous treeline upon the ridgeline, there is likely no-to-extremely limited visibility of the Proposed Development from this location.



Plate 1-2 View south-west from directly outside Camphire House

17th Century House at Headborough

The 17th Century House at Headborough, is shown in Plate 1-3 below. The front entrance to Headborough House was not publicly accessible beyond the location where the image below was captured. The house is also identifiable in Figure 1-3 (seen above), where it is shown to be surrounded by dense, mature woodland, as is also evident in the photo below. An appraisal conducted during a site visit determined that the Proposed Development would not be seen from Headborough House. This was particularly clear when investigating the house from the south-western entrance; where it was evident that the house itself is located below the crest of the valley and both the topography and woodland enclosing the House to the west and south would screen any views to the south-west in the direction of the Proposed Development. As shown in Figure 1-3 (previously), there is substantial visual separation from Headborough House and the proposed turbines when viewing it from the eastern side of the Blackwater Valley and any potential visual impact upon its setting would be negligible.



Plate 1-3 View west from the entrance to the 17th Century House at Headborough

Kilmore House

Plate 1-4 below shows a view of the entrance to Kilmore House from the R634 Regional Road. The site of the house itself is not accessible to the public and access could not be obtained during the site visit, as seen in Plate 1-4 below.



Plate 1-4 View of the locked entrance Kilmore House from the R634 Regional Road

Plate 1-5 below shows an aerial view of Kilmore House, the entrance to which is indicated on the map below. It can be seen that a large area of woodland is present on and surrounding the site. With the direction of the Proposed Development to the south, it is clear from the aerial imagery shown below that there will likely be no-to-extremely limited visibility of the Proposed Development from this site, as a result of screening from the vegetation (deciduous woodland) and the fact that there is already limited theoretical visibility indicated on the ZTV.



Plate 1-5 Aerial View of Kilmore House

With likely visibility greatly constrained from the sites discussed above, a number of Photomontages were produced from cultural heritage sites that were identified as having more open visibility of the Proposed

Development. These are assessed in full in the photomontage assessment tables contained in a separate appendix (Appendix 1). The specific impact on the settings of these cultural heritage sites are addressed in full in Appendix 6 of the Further Information Response although it is noted that there are no Significant residual visual or landscape effects arising at these locations as a result of the Proposed Development. The remainder of this section addresses the impact on the “wider landscape of the Blackwater River”.

1.2.3.2 Wider Landscape of the Blackwater River

Various photomontages were produced from viewpoints located both at cultural heritage sites and sites where there are open views of the Blackwater Valley and surrounding landscape. In general, the Blackwater River and River Bride are both located approximately 5-10km from the Proposed Development for large parts of their extents within the LVIA Study Area. In total there are eight Photomontages included in this response to a request for further information, from locations on the eastern side of the River Blackwater, and the northern side of the River Bride (the opposite side to the Proposed Development in both cases), showing the Proposed Development when it appears in similar directions to views of the landscape of these rivers. In this regard it is notable that from many locations on the opposite valley sides (i.e. western and southern) there is no theoretical visibility of the Proposed Development (see Figure 1-7 above) and consequently the Proposed Development has no impact on the landscape from these locations, in particular those locations lower in the valley and closer to the rivers, where the scenic amenity and quality of the landscape will remain undisturbed by the presence of the Proposed Development approximately 5-6 km away. The remainder of this section is broken down into two sections, discussing the views of the Proposed Development from the east along the Blackwater Valley itself and views from the north, along the valley of the River Bride, where the Blackwater Valley is often visible within open views. All Viewpoints discussed and noted below are fully assessed in Appendix 1 accompanying this report and can be viewed in the Photomontage Booklet also accompanying this report.

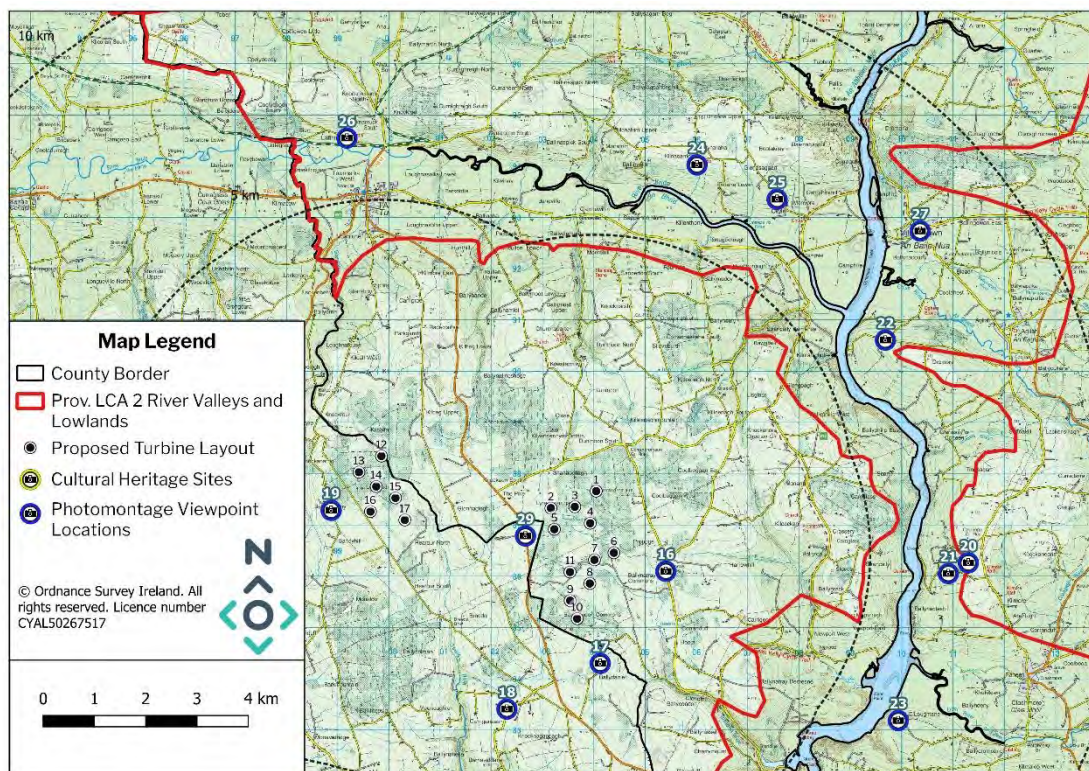


Figure 1-11 Viewpoints Locations for Photomontages showing the wider landscape of the Blackwater River Valley

Views from the east

Viewpoint 22 shows a view from a location close to the Dromore Viewpoint, with an impressive view to the north and west shown above in Figure 1-3, where the Proposed Development is seen in the opposite direction to the main view available from this area, which shows an impressive, highly scenic view over the Blackwater Valley and River Bride. The Proposed Development therefore does not interfere with the scenic views of the Blackwater and is appropriately sited in this regard.

Viewpoint 20 shows a view of the turbines behind the ridgeline formed by the Blackwater Valley, and while it does interfere somewhat with views of the valley in this regard, it does not obstruct views, which in this location are not actually of a particularly high scenic quality, especially in relation to other views of the landscape available in the general area discussed here. This is similarly the case with Viewpoint 21, although the turbines are much better screened in Viewpoint 21, given the location of the Viewpoint at lower elevation within the valley.

Viewpoint 23 is captured from D'Loughtane House, a cultural heritage site. The turbines of the eastern cluster are visible from this location, although they are small background elements located at the left-hand extent of the views of the Blackwater Valley.

This is generally the case for views of the Blackwater Valley from the east of the Proposed Development. The proposed turbines are viewed at the outer extent of the views in the direction of the valley walls, and there are limited locations where they will appear within views of the River itself. In all cases the Proposed Development is seen behind the ridgeline created by the valley walls and they are thus small background elements, often substantially screened. In all cases (i.e. all the Photomontages discussed here) the Proposed Development is seen above large tracts of commercial plantation forestry which are a large-scale human intervention in the landscape. Overall, the Proposed Development is well sited in relation to the views of the Blackwater Valley from the east, causing minimal interference in the views of a highest scenic quality, and appearing as background elements seen above commercial forestry plantations within other views in any case.

Views from the North

Viewpoint 24 shows a view from outside Ballynaraha Castle, which is located on private lands with no public access in any case, and there is just a single turbine seen above the treeline in this view. This turbine is also located to the right of the main view of the Blackwater Valley from this location, and consequently causes extremely limited interference with views of the Blackwater Valley as a result.

Viewpoint 25 shows a similar, although more open view of the River Blackwater and River Bride Valley from a similar orientation as Viewpoint 24, along a local road on the northern side of the valley of the River Bride. The best views of the River Blackwater and the Blackwater Valley are located to the left-hand extent of this view and the Proposed Development is visually separated from this view, seen to the right background of the image behind the ridgeline formed by the valley wall of the River Bride, and above a tract of commercial plantation forestry is a large-scale human intervention in the landscape.

Viewpoint 26 shows a view from Lisfinney Castle over the valley of the River Bride and the settlement of Tallow. The proposed turbines are, once again, seen as background elements within the view, above and behind the ridgeline formed by the valley walls, above a tract of commercial forestry.

The turbines are well absorbed and well sited in all cases (i.e. all the Photomontages discussed here). In general, they are substantially screened from this orientation by the intervening topography and vegetation and where they do appear they are seen in a coherent layout as small background elements. While they do appear in the direction of the views of the River Bride Valley, where there are views of the Blackwater Valley the turbines are often visually separated from the focus of the views in these cases. In all, the turbines cause minimal interference in the views of a scenic quality from the north of the River Bride.

Conclusion

The various Photomontages from multiple locations and perspectives along the “*wider landscape of the Blackwater River*” show that there is minimal interference with the scenic amenity of the landscape and that the layout of the Proposed Development is coherent and appropriately sited in relation to the landscape area. In essence the addition of the Proposed Development does not substantially detract from the scenic amenity of the area and does not affect the fundamental sensitivities of the landscape in view. The Proposed Development is often substantially screened by the intervening topography and commercial forestry of the Proposed Development Site itself, and there are large parts of the Blackwater Valley where there is no visibility of the Proposed Development. It is noted that in the viewpoint assessment tables contained in Appendix 1, there are no Significant residual visual effects deemed to arise, with an ‘Imperceptible’ effect deemed to arise at Viewpoint 38, a ‘Not Significant’ effect deemed to arise at Viewpoints 27, 22, 20, 21, ‘Slight’ at Viewpoints 23, 25, and 26. These suggest that the Proposed Development is effectively absorbed and sited within this landscape.

1.2.4 The R627 Regional Road

In relation to the R627 Regional Road the request for further information states that “*A photomontage to the south of Tallow along the R627 should also be provided.*”

It is noted, in relation to the visual impact assessment for the R627 Regional Road that Section 12.8.3.3.3 of the EIAR details that this road was included in the route screening assessment undertaken and it can be seen from Figure 12-13 of the EIAR that there is primarily intermittent screening present along the road in the direction of the Proposed Development. This road was driven again during a site visit conducted on 17th June 2022 and similar levels of screening were observed with limited open views towards the Proposed Development. Viewpoint 28 (presented in separate a Photomontage Booklet accompanying his document) shows a view from a location along the R627 where it intersects with the L7804 local road. This Photomontage shows an open view towards the Proposed Development from the road. As detailed in the viewpoint assessment table for Viewpoint 28 (contained in Appendix 1), Significant residual visual effects will not arise and the Proposed Development appears to be well absorbed within the landscape from this viewpoint. In addition, it is noted that the undulating topography within the view from this location provides substantial screening of the eastern cluster of turbines, limiting visibility of the Proposed Development even from this location with open views towards the site from the R627. The location of this Viewpoint is approx. 2.1km from the nearest turbine in the western cluster, which can be seen behind the ridgeline in the centre background of the image. Again, this viewpoint is fully assessed in a separate appendix, however, it is noted again that the turbines are seen to occupy a limited horizontal extent within the view and are viewed in the background, above a ridgeline currently covered in commercial plantation forestry. The landscape in the direction of the Proposed Development is undulating (hilly farmland and forestry) and is clearly capable of effectively absorbing the Proposed Development. The Proposed Development does not cause a Significant effect to arise on the fundamental sensitivities of the landscape in view from this location and will not cause a Significant effect to arise in relation to visual receptors on the R627.

Overall, given the level of screening present along the majority of the road, and informed by the photomontage produced from Viewpoint 28, there will be no Significant visual effects on the R627 as a result of the Proposed Development.

1.3 Point B

Point B of the request for further information states:

“(B) You are requested to review the photomontages undertaken and submitted by a number of the observers and provide a viewpoint assessment for each.”

The 3rd party Photomontages are reviewed in full with an individual viewpoint assessment table completed for each viewpoint included. These are presented in Appendix 3 which accompanies this report. It is noted that there are no Significant residual visual effects deemed to arise at any of the Viewpoints assessed in this Appendix. In this regard, it is instructive that these photomontage were submitted without a comprehensive visual assessment, and there is nothing in these photomontages that undermines the original landscape and visual impact assessment undertaken.

It is also noted that serious flaws were discovered in these 3rd Party Photomontages related to the placement of turbines within the views shown. A detailed critique and explanation of the issues related to these photomontages is present in a separate Appendix (Appendix 2) accompanying this report. However, it is noted here that these photomontages are clearly not an accurate depiction of the Proposed Development and in terms of relying on them to assess the visual effects, they are clearly not dependable. It is with this note of caution in mind that the assessment of the 3rd Party Photomontages is conducted (see Appendix 3 accompanying this response).

Finally, assessment of the Photomontages is conducted **as if** the Photomontages produced are accurate (which they are not). It is noted that no Significant Residual Visual Effects are deemed to arise as a result of this assessment. Further, it is not envisioned, in the professional judgement of the Landscape Team at MKO, that were the turbines placed correctly within these views it would not result in a determination that Significant Residual Visual Effects would arise, as is consistent with the original landscape and visual impact assessment conducted in the EIAR.

1.4

Point C

Point C of the Request for further information states:

“(C) You are requested to review and respond to the concerns raised by the Planning Authority in relation to Landscape and Visual Impact.”

The following sections break down and comprehensively address the submissions of the relevant Planning Authorities (Cork County Council and Waterford County Council) in relation to their concerns regarding the landscape and visual impact of the Proposed Development.

Section 6.2.12.7 of Cork County Council’s submission provides a comment on the Landscape and Visual Chapter (chapter 12) of the EIAR, and is discussed below first, followed by a discussion of Waterford County Council’s submission.

1.4.1

Landscape Character

Section 6.2.12.8 of Cork County Council’s submission provides a comment in relation to landscape character. In this section Cork County Council’s submission states that:

“Specifically in relation to landscape character, the draft guidelines detail six character types and provide guidance on appropriate design and siting for such landscapes. The applicants have not assigned the area a character type based on the draft guidelines but have instead assessed the proposal relative to the landscape character type assigned to it in the Cork County Draft Landscape strategy.”

The Council is incorrect in this assertion, the area has been assigned a character type – ‘Hilly and Flat Farmland’. Section 12.5.2.1 of the EIAR details that the Landscape Character Types set out in the Wind Energy Development Guidelines (2006, DoEHLG) and the Draft Revised Wind Energy Development Guidelines (2019, DoHPLG) were incorporated in the landscape baseline. The landscape and visual chapter of the EIAR states in relation to landscape character that:

“Despite the fact that the majority of the proposed development site is covered in commercial forestry, the original landcover will have been ‘hilly and flat farmland’ and the proposed development site is surrounded by extensive stretches of more ‘hilly and flat farmland’. Furthermore, the majority of areas in the study area can be described as ‘hilly and flat farmland’ with some areas of ‘transitional marginal land’ in the far north of the study area and there are ‘coastal’ areas in the south and west.

It is considered however that the ‘hilly and flat farmland’ landscape type most strongly influences the siting and design of the proposed development. Further details of this landscape character type are provided below.”

The landscape and visual chapter of the EIAR goes on to discuss the guidance for siting and design in relation to this landscape character type and the Proposed Development. In addition to this section within Chapter 12 of the EIAR, the guidelines for siting and design in relation to the Hilly and Flat Farmland landscape character type are referred to in relation to the layout of the Proposed Development multiple times throughout Appendix 12-3 of the EIAR which contains the viewpoint assessment tables. It is submitted that the EIAR fully considered the landscape character types set out in the relevant guidance, including the guidance on siting and design contained therein, contrary to the submission of Cork County Council, which appears to have overlooked this section.

Cork County Council’s submission goes on to state that:

“In terms of impacts on the Fissured Fertile Middleground, the landscape character type within which the western cluster is located, the applicant has determined that this area has a low sensitivity to wind farm development. The rationale for determining this sensitivity appears to be based on the overall area of this character area, which extends 61 kilometres to the west of the site. The applicant appears to have considered the impact of the wind farm on the Landscape character area in its totality.

The Planning Authority would have a concern with the approach taken by the applicant to considering the visual impacts of the proposal on the Fissured Fertile Middleground landscape character type. A more nuanced assessment is required that considers the more localized visual impacts on the landscape. To that end, the Bord may wish to consider the proposal in light of the six character types set out in the Draft Guidelines. This would allow for a more meaningful assessment of the visual impacts on the Landscape.”

The council is again incorrect in their assertion that the rationale for determining a low sensitivity to wind farm development for this landscape character type is *“based on the overall area of this character area, which extends 61 kilometres to the west of the site”*. The sensitivity of this landscape to wind farm development is discussed fully within Appendix 12-2 of the EIAR, which contains the landscape character assessment tables. In relation to landscape sensitivity for the Fissured Fertile Middleground LCT, Appendix 12-2 states:

“The 2007 Cork County Draft Landscape Strategy states that ‘there are numerous areas that have been identified under the County Development Plan as “Strategic Search Areas”. The majority of these areas are found to the northwest and west of this landscape type and the rest are scattered to the centre and east. Currently Windfarms are not a feature of the landscape but as much of the landscape is generally a preferred location for Windfarms, they may become more prominent in the future’. Therefore, a Low landscape sensitivity to wind farm development is assigned for this LCT.”

This is clearly the main rationale for the determination of a low landscape sensitivity to wind farm development in the EIAR. It is stated in Appendix 12-2 of the EIAR, as a mitigating factor, that *“Although the turbines will be located just within the eastern edge of this LCT the whole area of the LCT is vast and stretches up to approximately 61.4 kilometres west of the nearest turbine. Therefore, the landscape effects on the LCT as a whole will be Low.”* This is clearly not the rationale for determining a low landscape

sensitivity to this LCT as it is clearly stated that the scale of the LCT is considered in relation to landscape effects and not landscape sensitivity. Appendix 12-2 is referred to numerous times within the main landscape and visual chapter of the EIAR, including in Section 12.8.3.1 which discusses the effects on both the landscape character of the proposed site itself and the landscape character of the study area.

In addition, the submission of Cork County Council states that a *“more nuanced assessment is required that considers the more localized visual impacts on the landscape.”* In relation to this submission and the Fissured Fertile Middleground LCT, it is noted that Viewpoints 8, 10, 11, and 12 are located within this LCT, which are included in the determination of landscape effects on this LCT, as indicated by the landscape character assessment table for this LCT included in Appendix 12-2.

Overall, the points raised here in relation to the submission of Cork County Council demonstrate that when providing commentary, the Council has clearly not fully considered the extensive assessment of landscape character presented in the main body of the EIAR as well as in Appendix 12-2. In addition, it is clear from a review of these that the effects on landscape character were fully considered in the original EIAR.

Cork County Council’s submission goes on to state that:

“the Planning Authority would deem the landscape within which the western cluster of turbines is proposed as ‘Hilly and Flat Farmland’. As noted in the guidelines, the key features of these landscapes is order and simplicity. The layout presented consists of two principle clusters of turbines. The distance between the clusters is 2.8 kilometres. The impact of this arrangement from specific viewpoints is considered below. In broad terms however, the spatial extent with a somewhat random arrangement of turbines, when viewed from viewpoint 9 and 13 is a concern.”

In relation to spacing, the guidelines (Wind Energy Development Guidelines (2006, DoEHLG) and the Draft Revised Wind Energy Development Guidelines (2019, DoHPLG)) state:

“The optimum spacing pattern is likely to be regular, responding to the underlying pattern field pattern. The fields comprising the site might provide the structure for spacing of turbines. However, this may not always be the case and a balance will have to be struck between adequate spacing to achieve operability and a correspondence to field pattern.”

In relation to the above text, the Proposed Development is located within an area of coniferous plantation forestry surrounding primarily by farmland. The field pattern of this surrounding farmland is ordered but not linear and this causes the proposed layout of the turbines to assimilate well within the views in relation to the field pattern, when viewed from Viewpoints 9 and 13, as well as in the other Photomontages presented. In any case, it is noted in the guidelines that a balance must be struck in this regard. It is further noted in relation to the visual effects arising at these viewpoints, that from Viewpoint 9 a ‘Not Significant’ residual visual effect was deemed to arise, and from Viewpoint 13 a ‘Slight’ residual visual effect was deemed to arise.

In relation to the visibility of two clusters of turbines, visually separated and appearing as distinct developments from certain perspectives, such as those Viewpoints (9 and 13) highlighted in the above quoted text, it is noted that the guidelines for ‘Hilly and Flat Farmland’ state that *“visibility of two or more wind energy developments is usually acceptable.”* In fact, it is submitted that the turbines of the Proposed Development adhere strongly to the siting and design guidelines for Hilly and Flat Farmland landscape character type, further discussion around which is included in the landscape and visual chapter (Chapter 12) of the EIAR, as well as throughout Appendix 12-3 containing the Viewpoint Assessment Tables.

1.4.1.1 Zone of Theoretical Visibility Mapping

Cork County Council’s submission states, in *Section 6.2.12.8*, that

“The Planning Authority would also draw the Bords attention to the Zone of Theoretical Visibility, in particular the extend of the area to the north of the site from which 13-17 turbines will be visible. Based on topographical conditions, the ZTV could extend beyond the 20 km radius particularly in the areas to the north and north west, towards Mitchelstown.”

In order to comprehensively address the Council’s submission, a 35km Zone of Theoretical Visibility (ZTV) was run and is shown on Figure 1 below. However, it is necessary to first make a number of points in relation to the necessity (or lack thereof) of running a ZTV at this distance in order to assess any likely significant landscape and visual effects of the Proposed Development. Firstly, within the Wind Energy Development Guidelines (2006, DoEHLG) and the Draft Revised Wind Energy Development Guidelines (2019, DoHPLG) which are referenced numerous times by Cork County Council in their submission, it is stated that

“For blade tips in excess of 100m, a Zone of Theoretical Visibility radius of 20km would be adequate (this is twice conventional thresholds and reflects greater visibility of higher structures).

In areas where landscapes of national or international renown are located within 25 km of a proposed wind energy development, the Zone of Theoretical Visibility should be extended as far (and in the direction of) that landscape. This reflects the fact that highly sensitive landscapes deserve extra special treatment by developers and planners.”

Following the above quoted text from the guidelines it is submitted that the 20km ZTV used in the landscape and visual chapter of the EIAR is sufficient in the context of the Proposed Development. It is noted in this regard that views of the Proposed Turbines from locations outside of 20km from the Proposed Development are unlikely to be substantial, with the turbines appearing smaller the further from the Proposed Development that they are viewed, and are highly unlikely to result in significant landscape and visual effects. As a result, and in conjunction with other factors including the increased likelihood of complete screening of the proposed turbines with increased distance, significant landscape and visual effects are deemed unlikely to arise in this area beyond 20km from the Proposed Development. This is set out below, and within the landscape and visual chapter of the EIAR (Chapter 12) and Appendix 12-1, which outlines the methodology of the landscape and visual impact assessment.

The landscape and visual chapter (Chapter 12) of the EIAR states the following in relation to landscape and visual effects outside of the LVIA Study Area.

“on the basis of desk studies and survey work undertaken, the professional judgement of the assessment team, experience from other relevant projects and policy guidance or standards, the following topic areas have been scoped out of the assessment:

Effects on landscape and visual receptors that have minimal or no theoretical visibility (as predicted by the Zone of Theoretical or ZTV mapping; see Section 12.4.1 of this chapter for further details) and/or very distant visibility, and are therefore unlikely to be subject to significant effects.

Effects on landscape character beyond a 15km radius from the proposed development, where it is judged that potential significant effects on landscape character are unlikely to occur.

Effects on visual receptors beyond a 20km radius from the proposed development, where it is judged that potential significant effects are unlikely to occur.”

Following this, it is submitted, in relation to the submission of Cork County Council that while the ZTV could extend beyond the 20km radius, that such a case would still not result in significant landscape or visual effects given the distance from the Proposed Development and the relatively small horizontal or vertical extent of the Proposed Development within views at such a distance. As a result of this, and the other factors highlighted above, these areas with potential theoretical visibility beyond 20km from the

Proposed Development were scoped out of the assessment as explained in Chapter 12 of the EIAR (see the above quoted text).

In relation to potential views of the Proposed Development from this distance, Viewpoint 1 is located to the north of the Proposed Development and shows an open view towards the Proposed Development from a distance of approximately 19.8 km from the nearest proposed turbine (T12). A residual visual effect of Not Significant was deemed to arise at this location, despite the determination of a High sensitivity of the viewpoint. If this highly sensitive viewpoint with open views in the direction of the Proposed Development does not have significant visual effects arising as a result of the Proposed Development, then this demonstrates the likely significance of effects at locations a further distance from the Proposed Development than this viewpoint (Viewpoint 1).

In any case, a 35 km ZTV was produced and is shown on Figure 1 below. It can be seen clearly that the theoretical visibility in Mitchelstown, noted by Cork County Council, is not existent, i.e., there is no theoretical visibility of the Proposed Development in Mitchelstown. In addition, it can also be seen that the “*areas to the north*” outside of 20km (as highlighted by the County Council as having potential theoretical visibility) do not in fact have substantial areas of theoretical visibility beyond the 20km LVIA Study Area, as visibility is primarily constrained by the topography of the Knockmealdown Mountains.

Overall, it is submitted that discussion here has shown that, firstly, the Council’s concerns regarding the ZTV have already been addressed within Chapter 12 of the EIAR, which follows the guidance quoted by the Council themselves, and that any potential significant landscape and visual effects have been comprehensively assessed (including through the use of a Photomontage – Viewpoint 1).

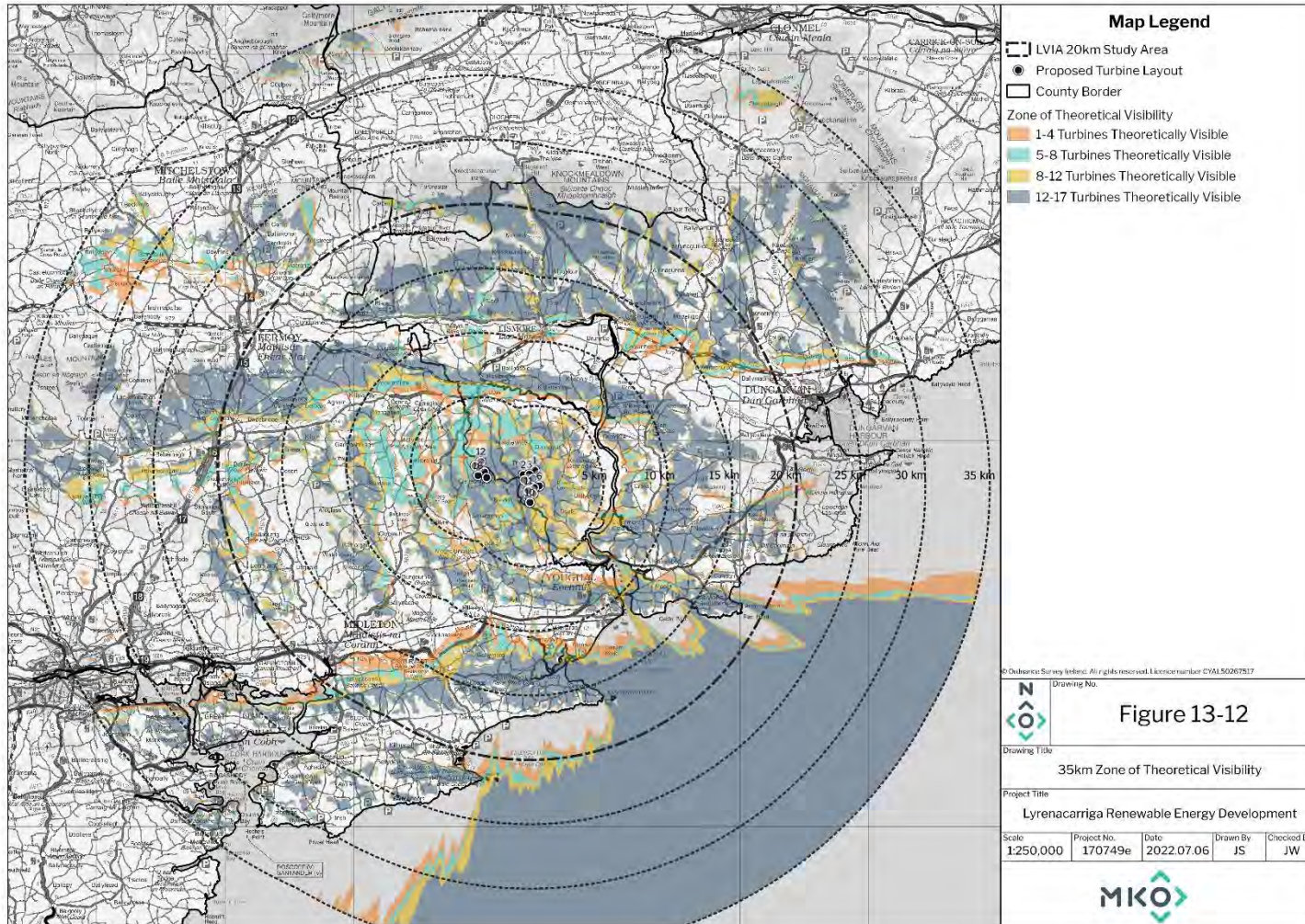


Figure 1-12 35km Zone of Theoretical Visibility

1.4.2 Impact on Scenic Route S45

Section 6.2.12.9 of Cork County Council's submission states that

“The applicant has provided a detailed consideration of the impacts along this route, Viewpoints 7a and 7b are taken from this route. In considering this view, the applicant has assigned the visual sensitivity of the receptor to low. In appendix 12-2, when describing this viewpoint, the applicant has not described it as a scenic route. Notwithstanding the specific regard given to S45 in Section 12.8.3.3.4 of the EIAR, the Planning Authority has serious reservations about the visual sensitivity afforded to the receptor at viewpoint 7. When considered from this viewpoint, 13 of the 17 turbines are visible.”

The original landscape and visual impact assessment conducted as part of the original EIAR and reported in Chapter 12 of that report, has included a detailed discussion of the scenic value attributable to this part of the designated scenic route (SR45) and the following quotes are relevant in relation to the above quoted submission:

“Viewpoint 7, less than 700 metres from the nearest turbine is on Co. Cork scenic route S45 and from this viewpoint the residual visual effects are considered ‘Slight’.”

“To the east the views are mainly short- to medium distance and in many cases greatly restricted by the adjacent coniferous forestry or roadside vegetation. It is only in the most southerly section this route that there are more medium to long-distance views to the south across agricultural land in the opposite direction to the turbines. These type of views are widely available around the local area and further afield, hence none of the views along Scenic Route S45 can be considered unique or remarkable.”

The viewpoint assessment conducted in Chapter 12 of the EIAR and in Appendix 12-3 are inter-related and it is clear from the above quoted text from Chapter 12 that the suggested sensitivity (by virtue of its designation as a scenic route) of this part of SR45 was incorporated into the overall assessment of the route. It is noted that in the second of the two quotes above clearly demonstrates that the actual on-the-ground scenic value offered by this stretch of road is low, given the existing views towards the Proposed Development Site, consisting of short-range views towards commercial forestry.

In any case, for the avoidance of doubt, the concerns of the County Council highlighted here related to the sensitivity of this viewpoint are addressed secondly through the capture of a photomontage at a location further south along the road, where the sensitivity is rated ‘Medium’ as explained in the text quoted below. Viewpoint 29 (shown on Figure 1-13 below) is located further south along the road, within County Cork. Viewpoint 29 is assessed in full detail in Appendix 1, however, it is noted that the sensitivity of the Viewpoint is deemed to be Medium in that location, as explained in the following quote from Appendix 1:

“Medium – As stated previously this view does not represent the view of any residential receptors and is likely only representative of motorists travelling along the regional road. While this is a designated scenic route there is limited scenic amenity attributable to this part of the view, considering it is a short-range view over a field towards commercial forestry.”

Essentially, while this viewpoint is located along a designated scenic route, in the professional judgment of the author, the scenic value attributable to this section of road is extremely limited. The view in either direction is a short-to-medium range view over agricultural fields towards tracts of commercial monoculture forestry, offering little by way of valuable scenic amenity. In fact, similar views (and commonly those of a higher scenic quality) are generally available throughout this part of the LVIA Study Area in close proximity to the Proposed Development.

In the case of this additional photomontage and visual assessment conducted, residual visual effects were deemed to be ‘Moderate’ and once again it is noted that Significant visual effects will not arise. The addition of the Proposed Development into views from this stretch of road will not significantly impact any key fundamental scenic sensitivities related to this stretch of road (as these are limited in any case). It is also emphasised that this stretch of road was considered in substantial detail in Section 12.8.3.3.4 of the EIAR with multiple rounds of imagery, overlaid wireframes, and now fully rendered Photomontages, as well as text-based discussion and explanation of likely visibility. It is submitted that due to the extensive amount of attention paid to this stretch of regional road that it is clear that no Significant visual effects will arise.

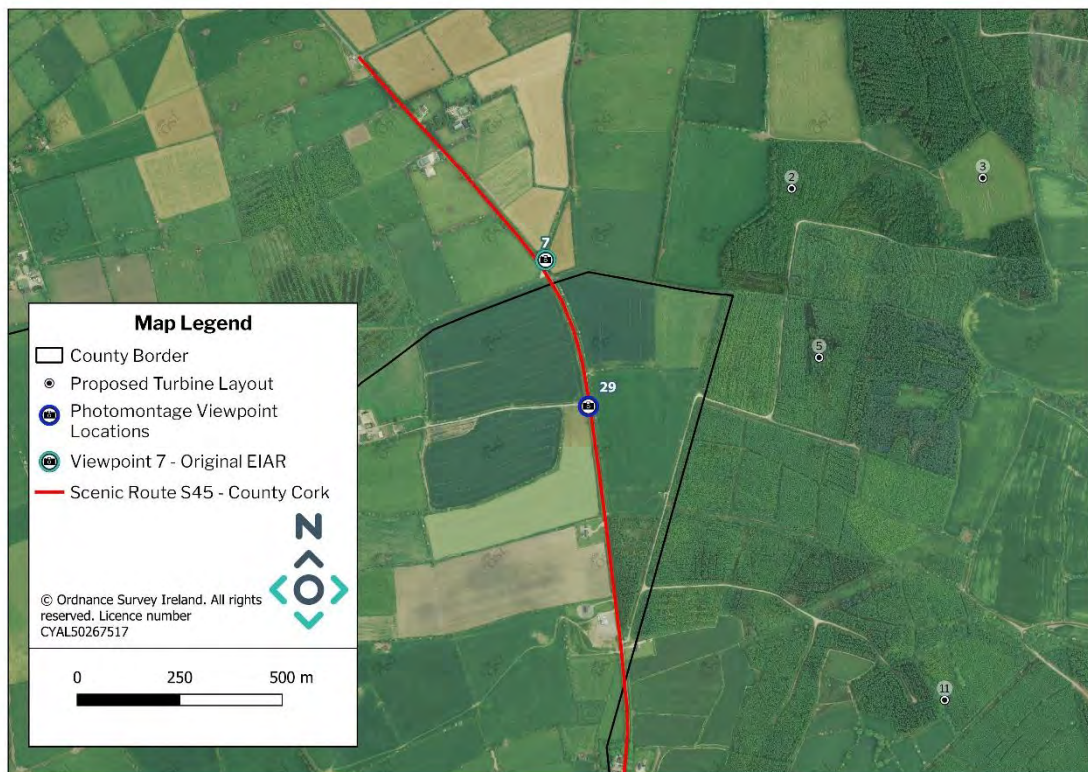


Figure 1-13 Viewpoint 45 Location

1.4.3 Impact on Scenic Route S47

Section 6.2.12.11 of Cork County Council’s submission states that

“Viewpoint 9 is taken from S47 (c. 15 kms to the south of the proposed turbines). From this vantage point, the wind farm will read as two distinct clusters, with the western cluster appearing taller. The eastern cluster is set on the northern slope of the hill. Particular attention will need to be paid to the spatial extent of the wind farm when viewed from this vantage point. The extent of that cluster in County Waterford, in particular Turbines 1 and 6 give this cluster an elongated form but lacking a distinct rhythm, the impact of which will need to be considered.”

As noted above in relation to the visual separation between the two clusters of turbines, the guidelines (Wind Energy Development Guidelines (2006, DoEHLG) and the Draft Revised Wind Energy Development Guidelines (2019, DoHPLG)) for ‘Hilly and Flat Farmland’ state that *“visibility of two or more wind energy developments is usually acceptable.”* From Viewpoint 9 the Proposed Development is viewed as within this landscape character type. Therefore, it is submitted that it is acceptable that the Proposed Development is viewed as two distinct clusters in this Photomontage, according to the guidelines cited within the Council’s submission itself.

In terms of the spatial extent of the Proposed Development in this Viewpoint (VP 9), it is noted that the wind farm is viewed at a substantial distance from this location (approximately 15 km away) and the two clusters actually occupy limited horizontal extents within the view and are effectively absorbed within the scale of the expansive view available from this location. In fact, this is noted in Appendix 12-3 of the EIAR, containing the detailed viewpoint assessment, where it is stated *“The spatial extent within this view of the proposed wind farm is very limited due to the great distance.”* Furthermore, in this regard it is emphasised that the turbines appear as small background elements visible above the skyline of the view, reducing the level of visual confusion introduced by the Proposed Development. A Not Significant residual visual effect was deemed to arise at this Viewpoint and it is submitted that all of the concerns raised by Cork County Council in relation to the visual impact on the scenic route represented by this viewpoint are included and incorporated into the assessment that was conducted and which arrived at this conclusion, which is fully detailed within Appendix 12-3 of the EIAR, as noted.

1.4.4 Impact on Scenic Route S6

Section 6.2.12.12 of Cork County Council’s submission states that

“Viewpoint 13 is taken from S6 to the north west. The spatial extent of the turbines when viewed from this vantage point merits consideration. The elongated irregular form of the eastern cluster, and the isolated location of turbine 1 is a concern.”

The viewpoint assessment table for Viewpoint 13 contained in Appendix 12-3 of the EIAR includes a detailed assessment of this viewpoint. Within this table it is stated that *“The spatial extent of the proposed wind farm in the view is minor, due to distance.”* It is also stated that the landscape within this view is an *“Expansive landscape able to absorb the proposed development.”* Both of these points are reiterated in relation to the concerns of Cork County Council regarding this Viewpoint, quoted above. It is further noted that a residual visual effect of Slight was deemed to arise at this Viewpoint as a conclusion of the assessment which is fully detailed within Appendix 12-3 (of the EIAR), as noted.

In terms of the form of the eastern cluster, it is submitted that the turbines of this cluster are actually relatively evenly spaced and are effectively absorbed within the view shown from this location, considering the scale of the expansive view available, and again is in line with the guidelines (Wind Energy Development Guidelines (2006, DoEHLG) and the Draft Revised Wind Energy Development Guidelines (2019, DoHPLG)) for ‘Hilly and Flat Farmland’.

1.4.5 Additional Visual Impacts to be Considered

Section 6.2.12.14 of Cork County Council’s submission states that

“Cork County Council has concerns that views from several important vantage points were not considered. Of particular concern is the lack of any visual assessment from the L7806, which runs immediately west of the western cluster of 6 turbines. Turbine 16 is c. 125 metres from this road in an open field. The visual impact of the proposed turbines will need to be further considered along this stretch of local road, particular at the points immediately south of the proposed access and a point 500 metres north of the access.”

Limited views were taken from the R627 to the south east of the proposed turbines. This is an important route between Middleton and Tallow. A more comprehensive assessment of potential visual impact along this route needs to be undertaken.”

During the LVIA conducted as part of the EIAR and reported in Chapter 12 (Landscape and Visual) a detailed scoping exercise, desk study and baseline study was conducted. This was done with the aim of assessing the **likely significant effects** of the Proposed Development. In relation [to](#) the level of detail to be included in a baseline study, the GLVIA (3rd ed) states the following:

“The level of detail provided should be that which is reasonably required to assess the likely significant effects.”

Within the landscape and visual chapter (Chapter 12) of the EIAR, the emphasis was on providing the level of detail necessary to assess the likely significant effects of the Proposed Development. The assertion of Cork County Council that *“several important vantage points were not considered”* is incorrect as these features of the landscape baseline were considered within the context of the overall LVIA Study Area and landscape baseline and were not chosen as specific viewpoints themselves as it was determined that **significant** landscape or visual impacts were unlikely to arise. It is noted in this regard that the transport routes surrounding the site were assessed using a multitude of tools and methods as detailed in Chapter 12 of the EIAR. Specifically, all transport routes within 5km of the Proposed Development were assessed as part of the route screening analysis, detailed in Section 12.8.3.3.3. Both the R627 and the L7806 were included within this assessment and it is noted that it was determined that there were no significant visual effects arising along these routes. In addition, there are numerous photomontage locations within 5 km of the Proposed Development that can be used to determine the likely views from the visual receptors highlighted by Cork County Council in the above quoted text. In relation to the selection of Viewpoint locations, the GLVIA (3rd ed) states:

“The emphasis must always be on proportionality in relation to the scale and nature of the development proposal and nature of the development proposal and its likely significant effects.”

In the selection of viewpoint locations, it is not possible to represent every single visual receptor identified in the study area with an individual photomontage and emphasis is put on those receptors with the potential to experience likely significant effects. In this regard it is noted that both the R627 regional road and the L7806 local road were determined to have primarily intermittent screening in the route screening analysis detailed in Section 12.8.3.3.3 of the EIAR (see Figure 12-13 of the EIAR), providing for limited availability of views of the Proposed Development from these routes. It is submitted that any likely significant effects on these receptors were properly considered within the original EIAR and that the concerns raised by the Council in relation to the potential for such effect have been included in the original assessment of effects.

However, for the avoidance of doubt as to the significance of visual effects on these receptors, both the R627 regional road and L7806 local road are discussed further below. In addition, a photomontage has been produced from a location along the R627 regional road. The L7806 local road was driven during a site visit conducted on 17th June 2022 and a number of images are used below to explain the likely visibility of the Proposed Development from this road.

L7806 Local Road

Section 6.2.12.14 of Cork County Council’s submission states that

“Of particular concern is the lack of any visual assessment from the L7806, which runs immediately west of the western cluster of 6 turbines. Turbine 16 is c. 125 metres from this road in an open field. The visual impact of the proposed turbines will need to be further considered along this stretch of local road, particular at the points immediately south of the proposed access and a point 500 metres north of the access.”

The following is a discussion of the L7806 local road detailing its conditions and the potential views towards the western cluster (the cluster located closer to this road) of turbines from locations along this road. An aerial view of this road is shown below in Figure 1-14 below, which shows the length of the stretch of road under discussion here, and the level of roadside screening as recorded during the LVIA conducted as part of the original EIAR (detailed in full in Section 12.8.3.3.3).

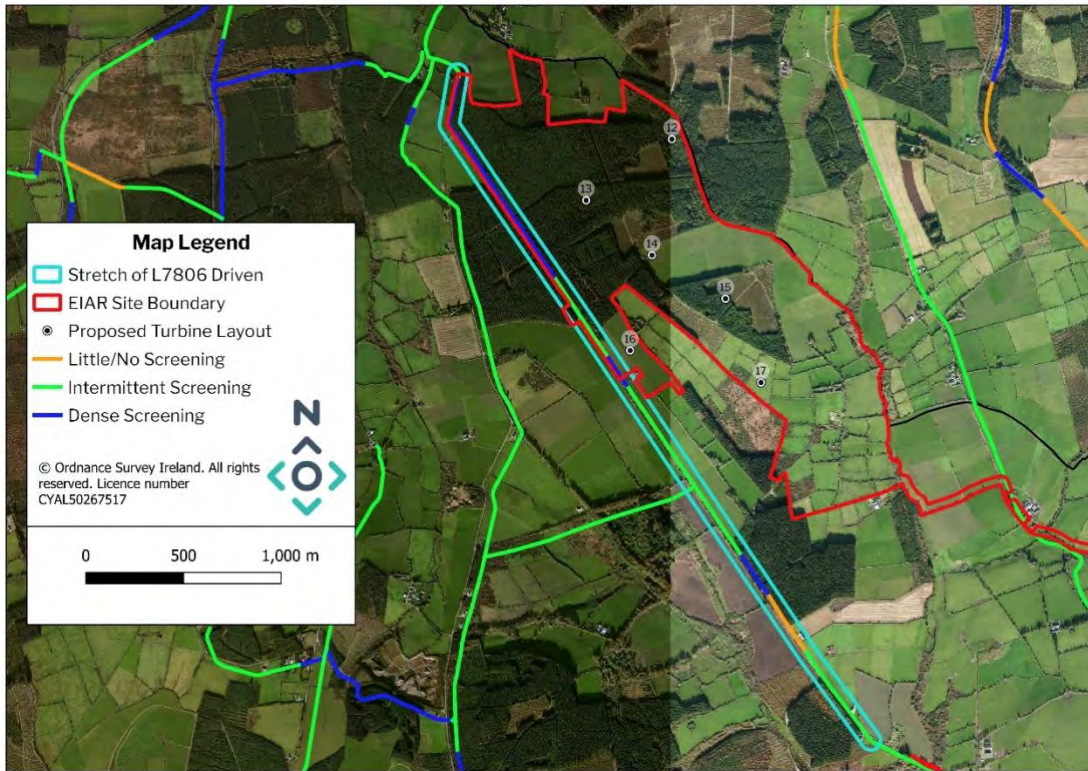


Figure 1-14 Aerial view of the section of the L7806 driven

During a site visit conducted on 17th June 2022 the portion of the road described in the above quoted text was driven from the north-west to the south-east, alongside the border with the western half of the Proposed Development Site. In general, visibility in the direction of the Proposed Development is heavily screened by the mature coniferous plantation forestry that comprises much of the landcover of the site, as seen in Plate 1-6 below (Proposed Development located to the left of the image).



Plate 1-6 View south from the L7806 – Proposed Development is located to the left of the image

This level of screening occurs for much of the northern half of the section of road that was driven, with it unlikely that there would be any visibility of the proposed turbines from these locations. Further south along the road, adjacent to turbine T16, the screening from the coniferous forestry falls away with the

changing land use (forestry to agriculture), allowing for more open views in the direction of the Proposed Development, as seen in Plate 1-7. There will likely be open views of T16 from this location which is approximately 135m from the turbine. However, it is emphasised that this a small local road of low quality and low traffic density, likely only used as a forestry access road and by a very limited number of local residents. There are also no other visual receptors (including residential) located along this stretch of road with open views.



Plate 1-7 View north from a location further south along the L7806, adjacent to T16

Further south along the local road, and further away from the Proposed Development, the level of roadside screening in the direction of the site increases, as seen below in Plate 1-8. The roadside screening provided by vegetation can be seen in this image to entirely screen any visibility in the direction of the Proposed Development from much of this section of the road.

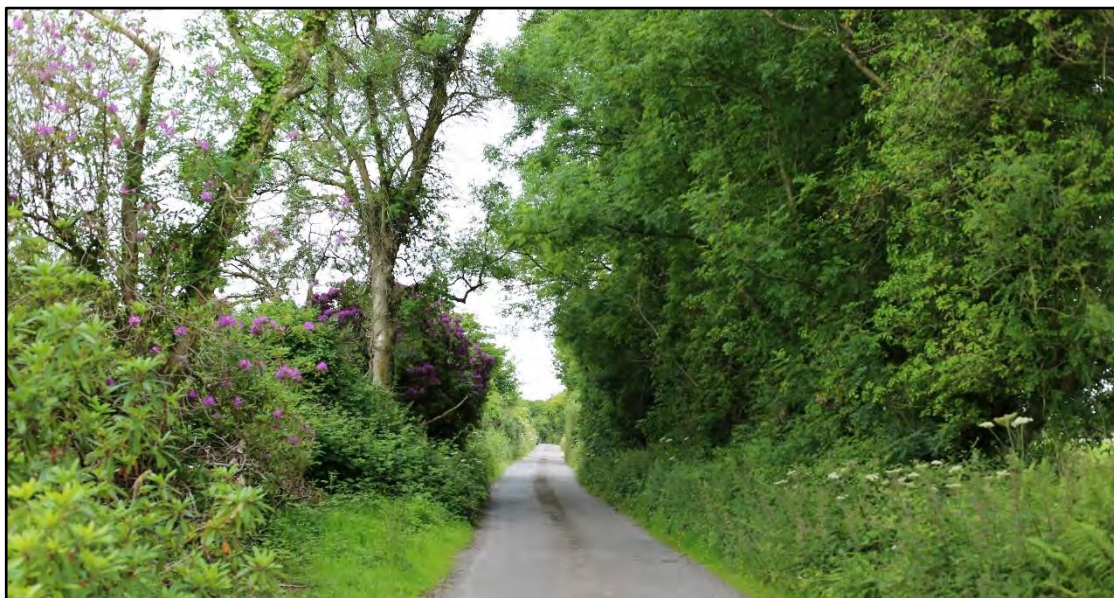


Plate 1-8 View north from the southern portion of the L7806

At the southern end of the stretch of road driven is a small cluster of residential properties located along the road. Plate 1-9 below shows a view from this location. From this stretch of road, a combination of the topography and roadside vegetation serves to substantially screen visibility of the Proposed Development Site.



Plate 1-9 View north-east from the southern extent of the stretch of the L7806 driven

In general, the L7806 is a small local road of low traffic density, that primarily leads to the large tracts of forestry located on the Proposed Development Site and its surrounds. As a result, the road itself has substantial levels of roadside screening from the coniferous trees of the forestry. This is the case “*at the points immediately south of the proposed access and a point 500 metres north of the access*”, with likely no to extremely limited visibility of the proposed turbines from these locations despite their proximity to the Proposed Development. Visibility from the section of road proximate to turbine T16 is likely open, with some intermittent screening provided by roadside vegetation. Further south the proposed site is once again heavily screened by roadside vegetation and topographical undulations. It is stressed at this point that the L7806 local road is not a highly sensitive visual receptor. It is a low-trafficked local road and significant visual effects are **not deemed to arise** on this road, despite its proximity to T16, with open visibility of this turbine from the stretch of the road which is closest to the turbine. It is further noted in relation to the claimed “*lack of any visual assessment from the L7806*”, that this section of road was driven and route screened during the LVIA that was conducted as part of the original EIAR, as detailed in Section 12.8.3.3.3 and shown above on Figure 1-14.

R627 Regional Road

Section 6.2.12.14 of Cork County Council’s submission states that

“Limited views were taken from the R627 to the south east of the proposed turbines. This is an important route between Middleton and Tallow. A more comprehensive assessment of potential visual impact along this route needs to be undertaken.”

In relation to this part of Cork County Council’s submission it is noted that the visual impact from the R627 regional road is discussed in some detail above in Section 1.1, with a Photomontage (and accompanying photomontage assessment table contained within Appendix 1) produced from a location along the road with open views towards the Proposed Development. The Proposed Development does not cause a Significant visual effect to arise on the fundamental sensitivities of the landscape in view from this location and will not cause a Significant effect to arise in relation to visual receptors overall in relation to the R627.

1.4.6 Impacts on Visual Amenity of Residential Properties

Section 6.2.12.15 of Cork County Council’s submission states that

“It is noted that the applicant has only considered the impact on 4 clusters of properties (22 units in total) in the area between the two clusters. Of these 22 units, only cluster 2 (3 units) and units 1,2,3 and 9 in Cluster 2 are in County Cork.

For the purposes of the visual assessment, the applicant has not identified all units within 1.2 kms of the proposed turbines. It should be noted that for the purposes of the noise assessment, which is set out in Chapter 13, 80 residential properties with 1.2 kms of the proposed turbines have been identified, 29 of which are in County Cork.

The applicant has not considered the visual impact of the turbines on those residential properties either to the west of the western clusters or those properties to the south of the eastern cluster. This is a concern particularly in light of Objective ED 3-5 of the County Development Plan which requires the consideration of impacts on residential amenity in respect of visual impact.”

In relation to the concern highlighted that *“the applicant has not identified all units within 1.2 kms of the proposed turbines. It should be noted that for the purposes of the noise assessment, which is set out in Chapter 13, 80 residential properties with 1.2 kms of the proposed turbines have been identified”*.

Potential for impact on sensitive residential receptors has been kept to the fore throughout the iterative design process adopted for the Proposed Development and has been considered in full within the EIAR. The Draft Revised Wind Energy Development Guidelines (2019, DoHPLG) contain Specific Planning Policy Requirements (SPPRs). Of specific relevance here in relation to appropriate setback distances is SPPR 2 which states:

SPPR2

“With the exception of applications where reduced setback requirements have been agreed with relevant owner(s) as outlined at 6.18.2 below, planning authorities and An Bord Pleanála (where relevant), shall, in undertaking their development planning and development management functions, ensure that a setback distance for visual amenity purposes of 4 times the tip height of the relevant wind turbine shall apply between each wind turbine and the nearest point of the curtilage of any residential property in the vicinity of the proposed development, subject to a mandatory minimum setback of 500 metres from that residential property. Some discretion applies to planning authorities when agreeing separation distances for small scale wind energy developments generating energy primarily for onsite usage.”

It is submitted that in relation to residential **visual** amenity, which is under consideration *“for the purposes of the visual assessment”*, a set-back distance of *“4 times the tip height of the relevant wind turbine”* is required in relation to residential visual amenity. As illustrated in Figure 1-15 below, the Proposed Development is compliant with the 4 times tip height set-back distance (noted above - SPPR 2) prescribed by the Draft Revised Wind Energy Development Guidelines (2019, DoHPLG).

Visual effects on residential receptors are considered outside of this requirement, as discussed in some detail within Section 12.8.3.5 of the EIAR (which discusses the visual effects on residential properties between the two clusters) as well through the use of various other photomontage viewpoints throughout the LVIA study area and discussion of visual effects within Sections 12.8.3.3.3 of the EIAR.

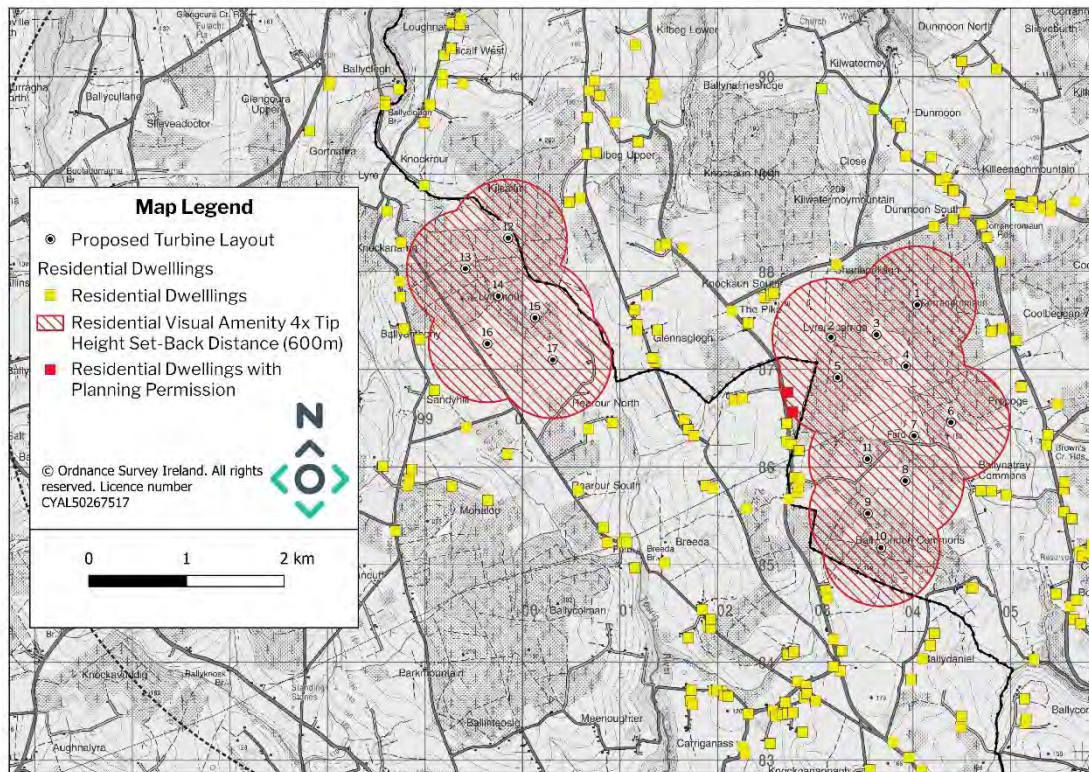


Figure 1-15 Residential Visual Amenity Set-Back Distance*

**Note: following an updated planning search since the original planning application was lodged with An Bord Pleanála for the Lyrenacarriga Wind Farm, two planning applications were granted by Cork County Council. These residential dwellings with planning permission (not yet constructed) were identified within the 600m set-back distance from turbine T5 and are shown on the map above. These receptors are addressed separately, below, in Section 1.7.*

The following text makes a number of points in relation to the following quote from Cork County Councils submission:

“The applicant has not considered the visual impact of the turbines on those residential properties either to the west of the western clusters or those properties to the south of the eastern cluster. This is a concern particularly in light of Objective ED 3-5 of the County Development Plan which requires the consideration of impacts on residential amenity in respect of visual impact.”

Firstly, a submission made above in relation to the comments of the Council in relation to the R627 and the L7806 is also applicable in this case regarding the lack of photomontages from specific visual receptors (in this case residential properties) noted in the above quoted text.

During the LVIA conducted as part of the EIAR and reported in Chapter 12 (Landscape and Visual) a detailed scoping exercise, desk study and baseline study was conducted. This was done with the aim of assessing the **likely significant effects** of the Proposed Development. In relation to the level of detail to be included in a baseline study, the GLVIA (3rd ed) states the following:

“The level of detail provided should be that which is reasonably required to assess the likely significant effects.”

Within the landscape and visual chapter (Chapter 12) of the EIAR which reports on the LVIA conducted the emphasis was on providing the level of detail necessary to assess the likely significant effects of the Proposed Development. In relation to the selection of Viewpoint locations, the GLVIA (3rd ed) states:

“The emphasis must always be on proportionality in relation to the scale and nature of the development proposal and nature of the development proposal and its likely significant effects.”

In the selection of viewpoint locations, it is not possible to represent every single visual receptor identified in the study area with an individual photomontage and emphasis is put on those receptors with the potential to experience likely significant effects. In relation to *“residential properties either to the west of the western clusters or those properties to the south of the eastern cluster”*, it is submitted that **it is not the case** that the visual impact on these properties was not considered in the original EIAR. The focus of the EIAR was on those residential properties with potential views of turbines in multiple direction as these were more likely to experience significant visual effects (although as noted in Section 12.8.3.5 of the EIAR, this is not the case). It is noted that there are a range of Viewpoints originally captured in close proximity to the Proposed Development (five in total, from multiple perspectives). However, to ensure that the Council’s concerns are fully addressed in relation to residential visual amenity a number of additional photomontages were prepared from *“those residential properties either to the west of the western clusters or those properties to the south of the eastern cluster.”*

The effects on residential visual amenity for the local community is addressed in some detail above in Section 1.2. This includes discussion of photomontages prepared from residential properties to the west of the western clusters and to the south of the eastern cluster. The discussion above is not repeated here however, it is noted that no Significant residual visual effects are deemed to arise at these locations and that the concerns raised by the Council in relation to these are fully addressed in Section 1.2. above, and within the photomontage assessment tables included in Appendix 1 accompanying this report.

1.4.7 Submissions of Waterford County Council

Waterford County Council has made a number of comments relating to the landscape and visual impact of the Proposed Development. A number of these comments are generic commentary relating to the 15 (no.) Photomontages presented in the original EIAR. It is reiterated in this regard that these Photomontages were assessed in substantial detail in Appendix 12-3 of the EIAR and no Significant residual visual effects were deemed to arise. It is submitted that none of the comments made by Waterford County Council in relation to these viewpoints suggest or imply that Significant visual effects arise.

1.4.7.1 Wind Energy Strategy

Waterford County Council’s submission states:

“Notwithstanding the designation of the Waterford portion of the site as a Preferred Area for Wind Development WCCC acknowledges that the technology at the time of that designation was significantly smaller than the overall height and rotor diameter of the now proposed turbines. While technology has evolved it is considered that there are serious concerns regarding these lands to visually accommodate the extent and scale of the turbines proposed in the current application having regard to these lands designations as Visually Sensitive and Visually Vulnerable with both local and wider views significantly impacted upon.”

The concerns highlighted above in relation to the ability of the Proposed Development Site to *“visually accommodate”* the proposed turbines are subject to extensive discussion in a number of sections within the EIAR (see Section 12.8.3.1, Section 12.8.3.2, Section 12.8.3.3, and Section 12.8 generally, as well as Appendix 12-2 which contains a comprehensive assessment of effects on landscape character within the LVIA Study Area). It is submitted that the landscape of the Proposed Development Site is entirely suitable for a wind energy development (as suggested by the designation of this area as a ‘Preferred Area’ in the Waterford County Development Plan 2011-2017, Waterford renewable energy Strategy 2016-2030 and Waterford City and County Development Plan 2022-2028) and is capable of visually accommodating a wind farm of this scale. The Proposed Development aligns well with the guidelines on siting and design (Wind Energy Development Guidelines (2006, DoEHLG) and the Draft Revised Wind Energy

Development Guidelines (2019, DoHPLG)) for ‘Hilly and Flat Farmland’. The two clusters of turbines are located at elevated locations in accordance with the guidelines which state that “*elevated locations are also more likely to achieve optimum aesthetic effect.*” Again, the iterative design of the Proposed Development has been conscious of this requirement and as such the site of the Proposed Development satisfies these desirable conditions. In all, the landscape of the site is entirely suitable for a wind energy development. It is not of high landscape value as it is primarily a commercial monoculture forestry site, and the location on a remote elevated site has ensured that it has avoided centres of population and that no Significant impacts on residential amenity occur (as detailed in full elsewhere in this document and within the original EIAR). It is also apparent throughout the entire range of Photomontages presented that the Proposed Development is effectively absorbed within the landscape within which it is viewed, particularly from locations where the Proposed Development is viewed within “*wider views*”, which is noted as a concern of Waterford County Council. Therefore, it is submitted that the Proposed Development Site is entirely suitable as a site for a wind energy development of this scale and is also aligned with the policy of Waterford County Council in this regard.

1.4.7.2 Settlements

Waterford County Council’s submission states

“It is considered the Visual Impact Assessment submitted is not sufficiently robust and additional view points both locally having regard to dwelling locations and settlements and also from the periphery from settlements further removed should have been assessed – such impacts should be assessed from open / worst scenario locations – not at points where local features obscure or partially obscure the development.”

In relation to the above quote a number of additional photomontages have been prepared from residential dwellings close to the Proposed Development that serve to supplement the original EIAR and assessment of the effects on residential visual amenity. These are outlined and discussed above and it is reemphasised here that there are no Significant visual effects that arise in relation to the Proposed Development.

Waterford County Council’s submission goes on to state:

“It is further noted that the closest occupied dwelling is 700m from a turbine, Turbine 6 and it is noted that there are two further turbines just over 700m from dwellings and these are Turbine 5 and 12. While it is set out that these turbines comply with minimum recommended separation distances it is considered this separation distance for developments so large could give rise to negative residential amenities and a visually overbearing impact.”

The residential receptors noted above are shown on Figure 1-16 below. In relation to the residential dwelling marked a No. 1 on the map below, this is owned by a participating landowner in the project.

In relation to the residential dwelling marked No. 2 on the map below, it is noted that a tall tract of coniferous forestry is located in the intervening space between the Proposed Development and the residential dwelling marked No. 2 on the map below, which will substantially screen the Proposed Development from view.

In relation to the residential dwelling marked as No. 3 on the map below, it is noted that bordering this receptor to the west is a large tract of commercial plantation forestry which provides substantial screening of views in the direction of the nearest turbine (T12). As a result, there are likely to be limited views in the direction of the Proposed Development (western cluster).

Overall, it is submitted that the concern highlighted by Waterford County Council in relation to houses located approximately 700m from the nearest turbine (although it is noted that these are compliant with the minimum recommended separation distances), that both houses number 2 and 3 are located in locations where there are substantial levels of screening provided by the commercial forestry present on

site and located in the intervening space between these receptors and the nearest turbines. It is submitted that this screening will limit visibility of the proposed turbines and provide a degree of separation such that the Proposed Development will **not** have a “visually overbearing impact.”

Visual effects in relation to the overall residential visual amenity of the local community are comprehensively addressed above in Section 1.1 and in Chapter 12 of the original EIAR.

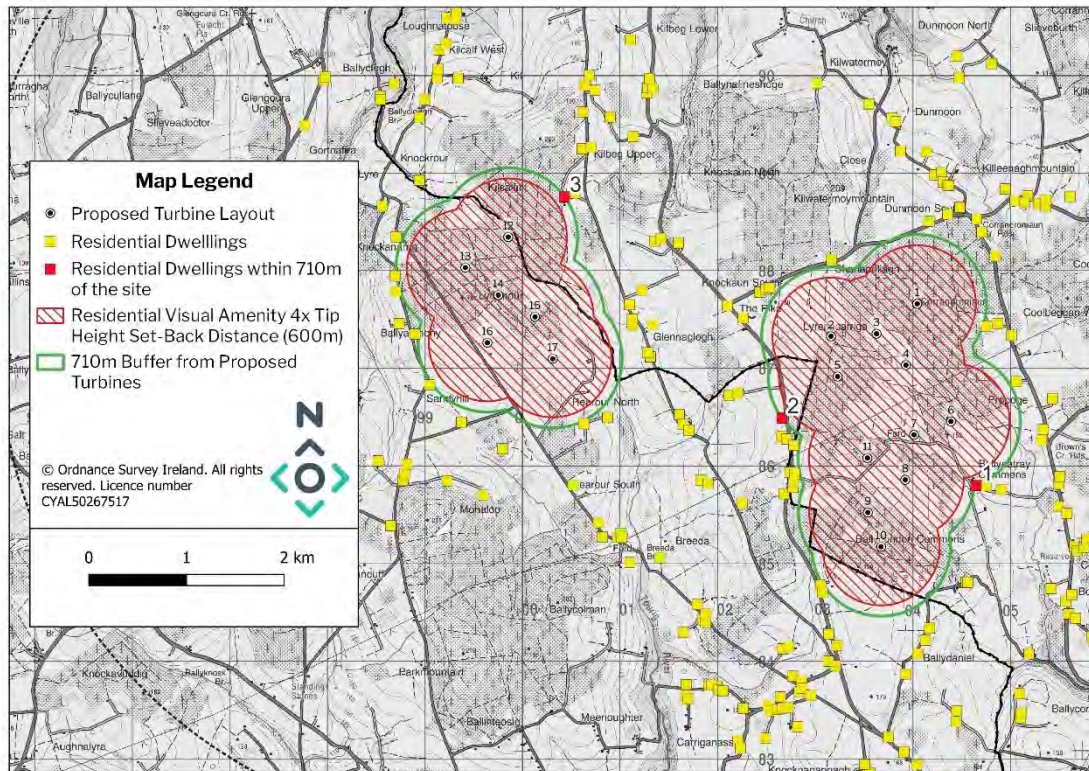


Figure 1-16 Residential Receptors highlighted by Waterford County Council

1.5 Response to Technical Assessment of Photomontages

A 3rd party submission prepared by Diana Royce, titled ‘Conformance and Technical Assessment of the Applicant’s Photomontage Visualisation for the Lyrenacarriga Wind Farm’ laid out a number of critiques of the Photomontages prepared by MKO as part of the EIAR. In relation to these critiques a number of points are made below relating to the relevance and pertinence of these critiques as they pertain to the visual impact assessment undertaken. However, it is noted that all of the points made below and the critiques made are in the first instance, immaterial to the determination of residual effects. It is submitted that even if all of the critiques made were valid then this would not have any material impact on the determination of the significance of visual effects conducted. An important point to be emphasised, prior to any discussion of the critiques made and before any consideration is given to this discussion, that the specific critiques made do not, in the professional judgement of MKO, constitute any meaningful or fundamental critique such that a determination of significance in the visual impact assessment would be altered as a result.

In relation to the critique of viewpoint selection, it is noted that the LVIA conducted as part of the EIAR comprehensively addresses the likely significant effects of the Proposed Development, and that this assessment is also supplemented by 14 no. additional photomontages, showing views from multiple perspectives and orientations representing both the local community and the Blackwater Valley. In total there are now 29 no. Photomontages showing the Proposed Development which is considered more than sufficient to determine if likely Significant landscape and visual effects are likely to arise.

In relation to the critique made of the camera used to capture the imagery under the heading ‘Photography’, where it is noted that *“in all cases except in Viewpoint 11/Glenacrogghery it is stated that the camera used is a Canon EOS 600D which has a 1.5 sensor”*, it is noted that this is actually incorrect labelling in the Photomontage Booklet prepared. All images were captured using a Canon EOS 5d Mk III with a 50mm lens. All images were captured using the *“correct equipment”*, as it is described by the author of the 3rd party submission.

In relation to the critique made under the heading ‘Technical Process’ where it is claimed that we do not know what turbine has been modelled, it is noted that the turbine dimensions (specifically the hub height and rotor diameter) of the turbines modelled in the Photomontages are listed clearly in the Photomontage Booklet, in the tables contained within that booklet listing other details such as viewpoint coordinates, date of image taken, etc. The author of the 3rd party submission appears to have overlooked these, although they are clearly presented.

In relation to *the “DTM Terrain model used to place the turbines into the photograph”* (under the Technical Process heading), a 10m terrain model was used, which is noted as acceptable by the author of the 3rd Party submission. As regards the remainder of the critiques made under this heading (Technical Process), it is submitted that none of the points made have any actual bearing on a determination of Significance. It is stated in the 3rd party submission that *“the turbines in these images are under-scaled and will appear larger and nearer in reality”*. The point made here is over-zealous as the turbines are not actually scaled incorrectly. The vertical field of view (VFOV) in the photomontages presented is 16.2 degrees, as this size image better fit within the layout of the Photomontage Booklet (the rendered turbines are the same size and scale in both 16.2 and 18.2 degree versions), this is an extremely minor difference in the vertical field of view from the 18.2 degrees. It is also clarified that this difference **does not reduce the scale** of the turbines themselves it only removes a minor part of the upper parts of the images (i.e. crops the sky), the turbines remain at the same size as they would otherwise in the image.

It is noted in relation to critiques made under the ‘Presentation’ heading, that multiple printed copies of the Photomontage booklets were submitted as part of the planning application and the relevance of the discussion under this point is questioned.

In relation to the ‘Summary’ contained in the 3rd party summary. It is noted that the author is over-zealous in their assertion that

“the applicant has not provided the public or the decision-makers with a reliable set of visualisations for the proposed Lyrenacarriga Wind Farm and that although the applicable Guidance has been cited by the applicant they have disregarded its most basic tenets and failed to be transparent about the technical process”

Minor errors (labelling, layout, etc.) do not amount to a disregard of *“most basic tenets”*. In addition, information claimed to not have been provided has indeed been provided as discussed above. If the critiques made in what appears to be a thorough validation of the photomontage booklet are the worst critiques that can be made of these photomontages, it highlights how fit for purpose the photomontages actually are for the determination of visual effects. None of the critiques made have any actual bearing on the appearance of the Proposed Development as presented in these photomontages.

The Photomontages are fit for purpose and sufficiently accurate for the task at hand. Any minor edits resulting from the critique made would not amount to a difference in the determination of visual effects made and there are no points raised that are fundamental to the determination of landscape and visual effects.

Turbine T5 – Alternative Location

Following an updated planning search since the original planning application was lodged with An Bord Pleanála for the Lyrenacarriga Wind Farm, two planning applications were granted by Cork County Council (PL Reference 21/7120 and 20/6991). These residential dwellings with planning permission (not yet constructed) were identified within the 600m set-back distance from turbine T5 and are shown on the map below. The proposed alternative location for T5 is also shown on this map, along with a line (green) indicating the 4x tip height set-back distance for this buffer. As shown, the proposed alternate location of T5 would ensure that the Proposed Development remains compliant with the required set-back distance set out under the Draft Revised Wind Energy Development Guidelines (2019, DoHPLG). In terms of the landscape and visual effects of the Proposed Development, the proposed alternate location will have an extremely low level of change, and there will be no fundamental change to the landscape and visual effects set out within the EIAR and accompanying documents. Any landscape effects discussed will be unchanged by virtue of the proposed movement of T5, with the character of the site remaining almost identical under the proposal.

An additional photomontage was also prepared from Viewpoint 29, seen in the map below, demonstrating the visual differences between the original location for T5 and the proposed alternative location. This photomontage can be seen in the Photomontage booklet accompanying this submission. It is emphasised that the slightly different positioning of the turbine will not affect the significance of the residual visual effect deemed to arise from this location. This is also the case for the other viewpoints, where the slight movement of T5 within the image will not alter the predicted residual visual effect. Overall, the alternative proposed location of T5 will not alter the significance of any of the landscape and visual effects reported.

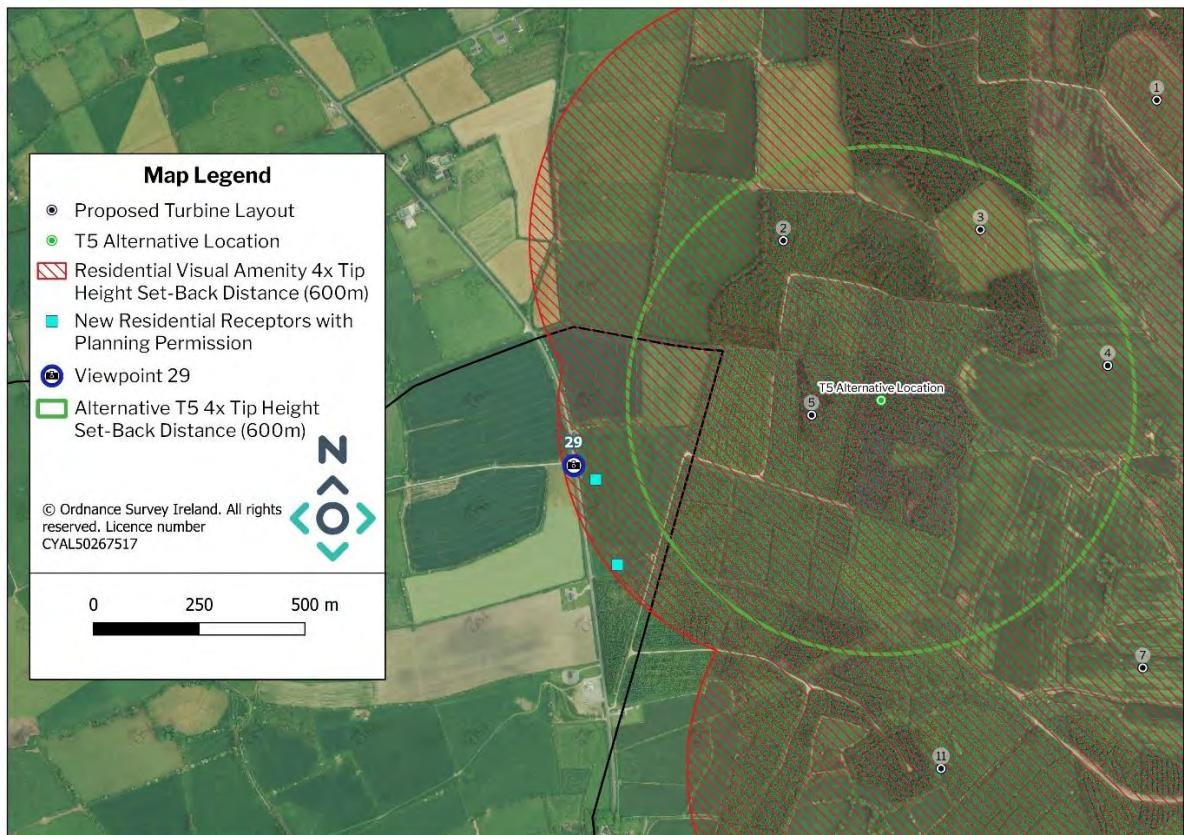


Figure 1-17 Sites of new planning permission and T5 alternative location



APPENDIX 1

PHOTOMONTAGE ASSESSMENT TABLES

Appendix 1 - Photomontage Assessment Tables

Proposed Lyrenacarriga
Wind Farm





DOCUMENT DETAILS

Client: **RWE**

Project Title: **Proposed Lyrenacarriga Wind Farm**

Project Number: **170749-e**

Document Title: **Appendix 1 - Photomontage Assessment Tables**

Document File Name: **Appendix 1 - Photomontage Assessment Tables – D2 - 2022.07.05**

Prepared By: **MKO
Tuam Road
Galway
Ireland
H91 VW84**



Rev	Status	Date	Author(s)	Approved By
01	Draft	2022.07.05	JS	JW
02	Final	2022.09.29	JS	

1.

PHOTOMONTAGE ASSESSMENT TABLES

A new supplementary photomontage booklet is included as part of this Further Information Response. The included photomontage booklet is a continuation of the Volume 2 booklet submitted with the original Lyrenecarriga Wind Farm EIAR. The supplementary booklet comprises 14 new photomontages in order to satisfactorily address points A & B of the boards further information request. The methodology and equipment used for photographic capture and preparation of these photomontages follows the same methodology used to create the 14 no. photomontages of the Volume 2 EIAR photomontage booklet. A comprehensive description of these methodologies are detailed in Section 1.4 of the LVIA methodology document – Appendix 12-1 of the Lyrenecarriga Wind Farm EIAR.

Additional viewpoint assessment tables for the additional 14 No. Viewpoints are included in this document. These additional tables follow the same format and structure as Appendix 12-3 of the Lyrenecarriga Wind Farm EIAR and provide a detailed assessment of the likely significance of visual effects arising as a result of the Proposed Development as viewed from each of the fourteen additional photomontage locations. Assessment of visual effects follow the same assessment methodology and grading criteria specified in section 1.5.3 of Appendix 12-1 of the Lyrenecarriga Wind Farm EIAR.

VP No.	Description	Grid Ref.
16	View from a local road in the townland of Propoge. This viewpoint is located approximately 1.1 km south-east of the nearest turbine (T6).	E 605,350 N 586,168
17	View from a local road in the townland of Ballydaniel. This viewpoint is located approximately 970m south-east of the nearest turbine (T10).	E 604,072 N 584,370
19	View from a local road in the townland of Ballyanthony. This viewpoint is located approximately 766m west of the nearest turbine (T16).	E 598,824 N 587,356
20	View from a local road in the townland of Coolbagh. This viewpoint is located approximately 6.9 km east of the nearest proposed turbine (T6).	E 611,251 N 586,333
21	View from a local road in the townland of Coolbagh, located further down the slopes of the Blackwater Valley than Viewpoint 34. This viewpoint is located approximately 6.5 km east of the nearest proposed turbine (T6).	E 610,861 N 586,123
22	View from a local road adjacent to the Dromoe Viewpoint, in the townland of Dromore. Dromore Viewpoint is a designated scenic viewpoint in the Draft Waterford County Development Plan 2022-2028. This viewpoint is located approximately 6.4 km north-east of the nearest proposed turbine (T1).	E 609,634 N 590,678
23	View from D'Loughtane House, a cultural heritage site in the townland of D'Loughtane. This viewpoint is located	E 609,884 N 583,255

VP No.	Description	Grid Ref.
	approximately 6.4 km south-east of the nearest turbine (T6).	
24	View from Ballynaraaha Castle, a cultural heritage site in the townland of Kilnacarriga. This viewpoint is located approximately 6.7 km north of the nearest turbine (T1).	E 605,959 N 594,095
25	View from a local road the townland of O’Kyle. This Viewpoint is located 6.7km north of the nearest turbine (T1).	E 607,521 N593,424
26	View from Lisfinney House, a cultural heritage site in the townland of Lisfinney. This viewpoint is located approximately 6.2 km north of the nearest turbine (T12).	E 599,131 N 594,618
27	View from the intersection of two local roads within Villierstown village, in the townland of Villierstown. This viewpoint is located approximately 8.4 km north-east of the nearest proposed turbine (T1).	E 610,310 N 592,806
28	View from the R627 regional road in the townland of Glengoura Upper. This viewpoint is located approximately 2.2 km north-west of the nearest turbine (T13).	E 597,535 N 589,306
29	View from the R634 regional road in the townland of Breeeda. This viewpoint is located along a designated scenic route in the Cork County Development Plan 2014. This viewpoint is located approximately 570m west of the nearest turbine (T5).	E 602,613 N 586,856

1.1

Visual Effects: Mitigation Factors:

The locations chosen for photomontages follow a detailed and extensive process including review of baseline information, site visits and high-quality photo taking at multiple locations within the LVIA study area. Many locations, which based on a desktop review had the potential for views of the site, had complete intervening screening or were screened to such an extent that the development of photomontages was not considered useful in terms of the assessment process i.e. little or no visibility towards the Proposed Development. It is therefore considered important to describe the nature of the proposed site and surrounds in order to provide context for this and avoid repetition in the viewpoint assessment tables below.

In general, coniferous forestry sites located on elevated locations within Hilly and Flat Farmland Landscape types tend to be capable of accommodating suitably designed wind farm projects of scale. The highly vegetated farmland landscape and abundance of coniferous forestry that surround the site provide lots of screening and has the capacity to significantly mitigate likely visual effects in close proximity to the site. Key reasons enabling the Proposed Development to be effectively absorbed by the landscape of the site and surrounding area are outlined below and are evident in the photomontages:

➤ **Strategic Siting in Relation to Scenic Views**

The Proposed Development is strategically sited so that it minimises the interference of the proposed turbines with the long-ranging scenic views within the LVIA Study Area, including views of the Blackwater Valley. A common theme seen throughout the photomontages is that the turbines are either located in the opposite direction to the direction of the scenic views from multiple locations, or that the main focus of the scenic view is not directly towards the proposed turbines. This is particularly relevant in relation to views from locations in close proximity to the Proposed Development, where turbines may appear as large vertical elements in one direction, but where the actual natural focus of views from these locations is away from the proposed turbines.

➤ **Strategic Siting – of the Proposed Development within a landscape area of large-scale human modification of the landscape**

The proposed turbines are sited, and are viewed, as within an area of commercial monoculture forestry. This commercial forestry generally limits views to shorter ranges from locations in close proximity to the Proposed Development and appears as a large-scale human modification of the landscape from a wide range of locations within the LVIA Study Area, and in particular from certain key sensitive locations including scenic amenity designations and within views representing the local community. This forestry also provides a degree of separation between viewpoints representing visual receptors located nearby the Proposed Development such as residential receptors.

➤ **Screening from surrounding landscape elements - commercial forestry**

The tracts of commercial plantation forestry noted are a prominent landscape feature of the Proposed Development Site and the surrounding landscape. Located between visual receptors and the proposed turbines, these and other vegetational elements of this highly vegetated landscape provide screening, obscuring views towards the proposed turbines or making those views intermittent in nature.

➤ **The Proposed Development does not obstruct landscape views of the Blackwater River or Valley and does not substantially impact scenic amenity attributed to the landscape of the valley.**

Views of the Blackwater Valley are generally not interfered with greatly, or obstructed by, the Proposed Development, and where long-range views of the Blackwater Valley are available, the Proposed Development is seen as visually separated from the landscape area surrounding the valley.

Viewpoint 16 - Propoge			
Viewpoint Description and Details	<ul style="list-style-type: none"> ➤ View from a local road in the townland of Propoge. ➤ This viewpoint is located approximately 1.1 km south-east of the nearest turbine (T6). ➤ Grid Reference: E 605,350, N 586,168 ➤ No. of turbines visible: 16/17 		
LCA and Sensitivity	Prov. LCA 1 South-Western Upland Plateau - Moderate	Visual Receptor(s) and Sensitivity	Motorists – Low Residents - High
Description of 'Baseline'	The foreground of the view is comprised of an agricultural field that slopes downwards towards a low hedgerow with a number of deciduous trees and shrubs interspersed along its path. An electricity line can be seen running parallel with this ditch. A number of other agricultural fields can be seen on the other side of this hedgerow, throughout the midground, which are backed by an area of commercial plantation forestry. This forestry is		

Viewpoint 16 - Propoge	
	bordered by a line of native deciduous trees providing some visual softening of the commercial forestry monoculture. This forestry is seen throughout the midground. In the background of the view the landform can be seen to slope upwards towards a ridgeline forming the skyline of the view, with the highest point along this ridgeline forming a small hill in the left background. The landcover here is coniferous monoculture forestry, demonstrating a substantial level of human interference in the landscape. This forestry is seen throughout the background and covers the vast majority of the ridgeline that forms the skyline. There are some longer-range views available in the left background, where the lower topography and lack of forestry permits views over the flat adjacent countryside.
Proposed Photomontage Description	The eastern cluster of the Proposed Development is seen throughout the background of the view, with 11 turbines seen almost in their entirety. In addition, the blade tips of five turbines of the western cluster are seen above the treeline formed by the commercial forestry. The turbines occupy a large vertical and horizontal extent within the view from this location. The turbines appear evenly spaced and with a coherent layout, with minimal overlap of turbine components. In addition, the eastern cluster can be seen to follow the ridgeline created by the topography, improving the visual absorption and coherency of the Proposed Development within the view. The turbines are also viewed across a small valley created by the topography, creating a degree of separation from this viewpoint and nearby residential receptors.
Turbine Range Assessment	It is noted that additional photomontages were produced showing a differing turbine configuration, the 'Lowest Hub and Longest Blade'. The difference between this configuration and the 'Highest Hub and Shortest Blade' is negligible in terms of visual effects, demonstrating that differences between differing turbine configuration within the range stated is negligible from a landscape and visual perspective.
Cumulative Effects	No other wind farms are visible, there are no cumulative visual effects.
Sensitivity of Visual Receptor(s)	Medium – This viewpoint represents a number of nearby residential receptors with views in the direction of the Proposed Development, however, it is noted that these views are at present views towards a large tract of commercial forestry and do not offer much by way of scenic amenity. In addition, this is a small local road with likely low traffic numbers.
Magnitude of Change	Substantial: <i>“Substantial change, where the proposals would result in large-scale, prominent or very prominent change, leading to substantial obstruction of existing view or complete change in character and composition of the baseline though removal of key elements or addition of uncharacteristic elements which may or may not be visually discordant. This includes viewpoints where the proposed development is fully or almost fully visible over a wide extent, at close proximity to the viewer. This change could be long term or of a long duration.” (LVIA Methodology Appendix 12-1 EIAR).</i> The Proposed Development occupies a large vertical and horizontal extent within the view and will result in large-scale change within the view. The

Viewpoint 16 - Propoge	
	character of the view will be altered substantially as a result of the Proposed Development.
Significance of Effect	Medium x Substantial = Moderate = Significant (EPA, 2022) An effect, which by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
Mitigation Factors	<ul style="list-style-type: none"> ➤ With regards to the siting of turbines in proximity to residential dwellings, the Proposed Development adheres to the minimum 500 metre set back distance in the current Wind Energy Development Guidelines (2006, DoEHLG) and also the 4 times tip height set-back distance explicitly set out for residential visual amenity prescribed by the Draft Revised Wind Energy Development Guidelines (2019, DoHPLG). ➤ The layout of the Proposed Development is coherent from this viewpoint with good spacing between turbines and minimal overlap of turbine components. ➤ Sparsely populated section of road and there are relatively limited numbers of nearby residential properties. ➤ The turbines are seen as set-back from this location due to the distances involved (approx. 1.1 km for the closest turbine) and the local topography which creates a degree of separation between the Proposed Development and the Viewpoint. ➤ The turbines are seen above tracts of coniferous plantation forestry which are a large-scale human intervention in the landscape. ➤ Siting and design were developed in accordance with the guidelines for Hilly and Flat Farmland landscape character type in which the Proposed Development is located.
Residual Effect (incl. mitigating factors)	Moderate (EPA, 2022) An effect that alters the character of the environment in a manner consistent with existing and emerging baseline trends.

Viewpoint 17 – Ballydaniel			
Viewpoint Description and Details	<ul style="list-style-type: none"> ➤ View from a local road in the townland of Ballydaniel. ➤ This viewpoint is located approximately 970m south-east of the nearest turbine (T10). ➤ This view is captured from a small local road of poor road quality. There are several residential receptors with these views nearby. ➤ The views to the east, away from the Proposed Development are long-ranging and expansive, whereas views towards the site are short-range views towards commercial forestry monoculture. ➤ This viewpoint is approximately 970m south-east from the nearest turbine (T10). ➤ Grid Reference: E 604,072, N 584,370 ➤ No. of turbines visible: 9/17 		
LCA and Sensitivity	LCT 10b Fissured Fertile Middleground (Rylane east to Waterford) - Low	Visual Receptor(s) and Sensitivity	Motorists – Low Residents - High

Viewpoint 17 – Ballydaniel	
Description of 'Baseline'	The foreground of this view is of an agricultural field which takes up the majority of the foreground and midground. A metal gate which borders the local road can be seen in close proximity to the viewpoint, in the right foreground. The agricultural field is bordered by a mature hedgerow with several deciduous trees and shrubs interspersed along it, seen in the right midground. The agricultural field seen throughout the left foreground and midground has a gentle slope upwards towards the left-hand side of the image. Views are restricted to relatively short distance by the commercial plantation forestry that can be seen throughout the background of this view, and the ridgeline formed by the rising topography. The monoculture forestry obstructs and longer-ranging views in this direction. A line of deciduous native trees can be seen in front of the commercial forestry providing some visual softening of the views of the forestry.
Proposed Photomontage Description	There are seven turbine hubs visible within this Photomontage, with the turbine towers of five of these turbines also partially visible. In addition, there are the blades of two more turbines visible above the treeline. The remainder of the turbine components and other turbines in the Proposed Development are screened by the intervening topography or the commercial forestry. The closest turbine (T10) is located just under 1 km from the viewpoint and, along with turbine T9 and T8, occupies a relatively large vertical extent within the view. The proposed turbines are viewed behind an initial tract of commercial forestry and on the other side of a high point in elevation, providing a degree of separation from the viewpoint and the turbines. The proposed turbines do not interfere with any view of scenic value
Cumulative Effects	No other wind farms are visible, there are no cumulative visual effects.
Sensitivity of Visual Receptor(s)	Medium – The viewpoint is mainly representative of the views from several residential receptors located approx. 1km from the nearest turbine. While residential receptors are generally sensitive receptors, the direction of the turbines in relation to these dwellings means that it will be the gable end of these properties that will face towards the proposed turbines limiting available views of the Proposed Development from these dwellings. In any case, the views of primary scenic amenity from these dwellings are directed away from the Proposed Development to the east, where the topography slopes downwards allowing long-range views over the countryside.
Magnitude of Change	<p>Substantial: <i>“Substantial change, where the proposals would result in large-scale, prominent or very prominent change, leading to substantial obstruction of existing view or complete change in character and composition of the baseline though removal of key elements or addition of uncharacteristic elements which may or may not be visually discordant. This includes viewpoints where the proposed development is fully or almost fully visible over a wide extent, at close proximity to the viewer. This change could be long term or of a long duration.” (LVIA Methodology Appendix 12-1 EIAR).</i></p> <p>The turbines (particularly those closest to the viewpoint) appear to occupy a large vertical extent within the view. The turbines do change the character of the view in this direction, although it is noted that the baseline character of the view is one of commercial forestry operations.</p>

Viewpoint 17 – Ballydaniel	
Significance of Effect	Medium x Substantial = Moderate = Significant (EPA, 2022) An effect, which by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
Mitigation Factors	<ul style="list-style-type: none"> ➤ With regards to the siting of turbines in proximity to residential dwellings, the Proposed Development adheres to the minimum 500 metre set back distance in the current Wind Energy Development Guidelines (2006, DoEHLG) and also the 4 times tip height set-back distance explicitly set out for residential visual amenity prescribed by the Draft Revised Wind Energy Development Guidelines (2019, DoHPLG). ➤ The turbines occupy a limited horizontal extent within the view. ➤ There are views of a much higher scenic quality available to the east, away from the Proposed Development. Whereas existing views towards the Proposed Development site are short-range views of commercial forestry. ➤ Sparsely populated section of road and there are relatively limited numbers of nearby residential properties. ➤ The turbines are seen above the skyline of the view in a coherent layout. ➤ The turbines are seen above tracts of coniferous plantation forestry which are a large-scale human intervention in the landscape.
Residual Effect (incl. mitigating factors)	Moderate (EPA, 2022) An effect that alters the character of the environment in a manner consistent with existing and emerging baseline trends.

Viewpoint 19 – Ballyanthony			
Viewpoint Description and Details	<ul style="list-style-type: none"> ➤ View from a local road in the townland of Ballyanthony. ➤ This viewpoint is located approximately 766m west of the nearest turbine (T16). ➤ Grid Reference: E 598,824, N 587,356 ➤ No. of turbines visible: 6/17 		
LCA and Sensitivity	LCT 10b Fissured Fertile Middleground (Rylane east to Waterford) - Low	Visual Receptor(s) and Sensitivity	Motorists – Low Residents - High
Description of 'Baseline'	This view looks onto a grassland field that can be seen throughout the centre midground, with residential dwellings bordering the field to the left and right-hand sides. The dwelling seen in the right midground of the 120 degree view can be seen to be bordered to the rear by a treeline of mature deciduous tree and lower shrubs. The dwelling in the left background is seen above a dense mature hedgerow that screens most of the building from view. The topography in the view slopes upwards, forming a ridgeline that prevents long-range views to in the centre background. This ridgeline formed by the topography, and the mature treelines seen in the view, restrict visibility to short-range views from this location.		

Viewpoint 19 – Ballyanthony	
Proposed Photomontage Description	There are five turbine hubs within view, with the blade of one additional turbine visible above a tree adjoining the residential dwelling in the left-midground. This screening effect will differ depending on the exact location of the viewer. The turbines occupy a large vertical extent within the view and are seen behind the ridgeline formed by the topography in the background, providing a degree of separation between the turbines and the viewpoint. The turbines are well spaced and the layout appears coherent from this location, with minimal overlap of turbine components apparent.
Cumulative Effects	No other wind farms are visible, there are no cumulative visual effects.
Sensitivity of Visual Receptor(s)	Medium – This viewpoint represents a number of nearby residential receptors with views in the direction of the Proposed Development, however, it is noted that these views are at present short-range views towards commercial forestry (in the case of the dwelling seen to the left-hand side, and a short -range view of an agricultural field in the case of the dwelling seen to the right-hand side) and do not offer much by way of scenic amenity. In addition, this is a small local road with likely low traffic numbers.
Magnitude of Change	<p>Substantial: <i>“Substantial change, where the proposals would result in large-scale, prominent or very prominent change, leading to substantial obstruction of existing view or complete change in character and composition of the baseline though removal of key elements or addition of uncharacteristic elements which may or may not be visually discordant. This includes viewpoints where the proposed development is fully or almost fully visible over a wide extent, at close proximity to the viewer. This change could be long term or of a long duration.” (LVIA Methodology Appendix 12-1 EIAR).</i></p> <p>The Proposed Development occupies a large vertical extent within the view and will result in large-scale change within the view. The character of the view will be altered substantially as a result of the Proposed Development.</p>
Significance of Effect	<p>Medium x Substantial = Moderate = Significant (EPA, 2022)</p> <p>An effect, which by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.</p>
Mitigation Factors	<ul style="list-style-type: none"> ➤ With regards to the siting of turbines in proximity to residential dwellings, the Proposed Development adheres to the minimum 500 metre set back distance in the current Wind Energy Development Guidelines (2006, DoEHLG) and also the 4 times tip height set-back distance explicitly set out for residential visual amenity prescribed by the Draft Revised Wind Energy Development Guidelines (2019, DoHPLG). ➤ There are views of a much higher scenic quality available to the east, away from the Proposed Development. Whereas existing views towards the Proposed Development site are short-range views of commercial forestry. ➤ The existing views are short-range views over an agricultural field and are not of a high scenic quality. Therefore, the addition of the Proposed Development does not adversely affect views of sensitive scenic landscape features.

Viewpoint 19 – Ballyanthony	
	<ul style="list-style-type: none"> ➤ Sparsely populated section of road and there are relatively limited numbers of nearby residential properties. ➤ The turbines are seen above the skyline of the view in a coherent layout.
Residual Effect (incl. mitigating factors)	<p>Moderate (EPA, 2022) An effect that alters the character of the environment in a manner consistent with existing and emerging baseline trends.</p>

Viewpoint 20 – Coolbagh - Higher up the Valley			
Viewpoint Description and Details	<ul style="list-style-type: none"> ➤ View is from a local road in the townland of Coolbagh. ➤ This viewpoint is located approximately 6.9 km east of the nearest proposed turbine (T6). ➤ Grid Reference: E 611,251, N 586,333 ➤ No. of turbines visible: 16/17 		
LCA and Sensitivity	Provisional LCA 2 River Valleys and Lowlands – High	Visual Receptor(s) and Sensitivity	Motorists – Low Residents – Medium
Description of ‘Baseline’	<p>This view is captured from a small local road seen in the left foreground. The road slopes downwards towards the River Blackwater (which is not visible from this location) offering open views over a roadside hedgerow of the opposite valley slope. The foreground of the view consists of a mature hedgerow that borders an agricultural field. Such fields commonly make up the majority of the landcover here, with the field pattern predominating throughout the background of the view. In addition to these fields there are several farmsteads scattered throughout the midground and background, as well as a number of deciduous treelines, again bordering the agricultural fields. The landform rises in the background of the view forming a ridgeline with a rise in elevation to the right background. Along the ridgeline a number of tracts of coniferous plantation forestry can be seen. The landscape is seen to be substantially modified by man in terms of the agricultural fields and the tracts of commercial forestry that define the view, as well as the electricity lines that introduce vertical elements into the view. The character of the view is rural in nature, and this view is typical of views in this area.</p>		
Proposed Photomontage Description	<p>Both the eastern and western cluster of turbines appear in the centre background of this view. Turbines from the western cluster appear slightly smaller than the eastern cluster, although this effect is minimal from this distance. The turbines are generally evenly spaced, aside from a number of overlapping turbine components from more-distant turbines in the western cluster, although in general the layout is coherent and appropriate for this landscape type. There is some screening of the turbine towers of certain turbines by the topography and coniferous plantation forestry, particularly turbines of the western cluster (seen to the right-hand side of the line of turbines), where several turbines are almost completely screened. The</p>		

Viewpoint 20 – Coolbagh - Higher up the Valley	
	turbines appear behind the ridgeline and so do not obstruct or interfere with any longer-ranging views.
Turbine Range Assessment	It is noted that additional photomontages were produced showing a differing turbine configuration, the 'Lowest Hub and Longest Blade'. The difference between this configuration and the 'Highest Hub and Shortest Blade' is negligible in terms of visual effects, demonstrating that differences between differing turbine configuration within the range stated is negligible from a landscape and visual perspective.
Cumulative Effects	No other wind farms are visible, there are no cumulative visual effects.
Sensitivity of Visual Receptor(s)	Medium: This viewpoint is located along what is a small local road with likely low traffic numbers. The most sensitive receptors are nearby residential receptors who are located over 6 km from the nearest turbine. The views from this location, representative of likely views of nearby residential receptors, while rural in nature and relatively long-distance, are not of a particularly high scenic quality, particularly in relation to high quality scenic views of the Blackwater Valley available elsewhere along its extent.
Magnitude of Change	<p>Slight: <i>“The proposals would be partially visible or visible at sufficient distance to be perceptible and result in a low level of change in the view and its composition and a low degree of contrast. The character of the view may be altered, but will remain similar to the baseline existing situation. This change could be short term or of a short duration.” LVIA Methodology Appendix 12-1 ELAR).</i></p> <p>The Proposed Development is seen in the background of the view at a distance sufficient to result in a low level of change in terms of the scenic amenity attributable to this view. The turbines do not obstruct the views of the Blackwater Valley and are seen as relatively small background elements.</p>
Significance of Effect	<p>Medium x Slight = Minor = Slight (EPA, 2022) An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.</p>
Mitigation Factors	<ul style="list-style-type: none"> ➤ The distance of the viewpoint from the Proposed Development reduces the scale of the turbines, which appear as background elements within the view. ➤ Sparsely populated section of road and there are limited numbers of nearby residential properties. ➤ The turbines are viewed within the background of the view, above the skyline and do not obstruct the views of a scenic quality of the Blackwater River valley and surrounds. ➤ The turbines are seen above tracts of coniferous plantation forestry which are a large-scale human intervention in the landscape. ➤ Siting and design were developed in accordance with the guidelines for Hilly and Flat Farmland landscape character type.
Residual Effect (incl. mitigating factors)	<p>Not Significant (EPA, 2022) An effect which causes noticeable changes in the character of the environment but without significant consequences.</p>

Viewpoint 21 – Coolbagh - Lower down the Valley			
Viewpoint Description and Details	<ul style="list-style-type: none"> ➤ View is from a local road in the townland of Coolbagh, located further down the slopes of the Blackwater Valley than Viewpoint 34. ➤ This viewpoint is located approximately 6.5 km east of the nearest proposed turbine (T6). ➤ Grid Reference: E 610,861, N 586,123 ➤ No. of turbines visible: 10/17 		
LCA and Sensitivity	Provisional LCA 2 River Valleys and Lowlands – High	Visual Receptor(s) and Sensitivity	Motorists – Low Residents – Medium
Description of ‘Baseline’	<p>This view is captured from a small local road seen in the centre foreground. The road slopes downwards towards the River Blackwater (which is not visible from this location) offering open views over the agricultural fields and roadside hedgerows located on either side of the road of the opposite valley wall. The foreground of the view consists of a mature hedgerow that borders an agricultural field on either side of the road. Such fields commonly make up the majority of the landcover here, with the field pattern predominating throughout the background of the view. In addition to these fields there are several farmsteads scattered throughout the midground and background, as well as a number of deciduous treelines, again bordering the agricultural fields. The landform rises in the background of the view forming a ridgeline with a noticeable rise in elevation in the right background. Along the ridgeline a number of tracts of coniferous plantation forestry can be seen. The landscape is seen to be substantially modified by man in terms of the agricultural fields and the tracts of commercial forestry that define the view, as well as the electricity lines that introduce vertical elements into the view. The character of the view is rural in nature, and this view is typical of views in this area.</p>		
Proposed Photomontage Description	<p>Both the eastern and western cluster of turbines appear in the centre background of this view. The turbines are substantially screened by the intervening ridgeline with only the hubs of turbines visible in most instances. The turbines are generally evenly spaced, aside from a number of overlapping turbines components from more-distant turbines in the western cluster, although in general and the layout is coherent and appropriate for this landscape type. There is some screening of the turbine towers of certain turbines by the topography and coniferous plantation forestry, particularly turbines of the western cluster (seen to the right-hand side of the line of turbines), where seven turbines are completely screened. The turbines appear behind the ridgeline and so do not obstruct any longer-ranging views.</p>		
Cumulative Effects	No other wind farms are visible, there are no cumulative visual effects.		
Sensitivity of Visual Receptor(s)	<p>Medium: This viewpoint is located along what is a small local road with likely low traffic numbers. The most sensitive receptors are nearby residential receptors who are located over 6 km from the nearest turbine. The views from this location, representative of likely views of nearby residential receptors are, while rural in nature and relatively long-distance, are not of a particularly high scenic quality, particularly in relation to higher</p>		

Viewpoint 21 – Coolbagh - Lower down the Valley	
	quality scenic views of the Blackwater Valley available elsewhere along its extent.
Magnitude of Change	<p>Slight: <i>“The proposals would be partially visible or visible at sufficient distance to be perceptible and result in a low level of change in the view and its composition and a low degree of contrast. The character of the view may be altered, but will remain similar to the baseline existing situation. This change could be short term or of a short duration.” LVIA Methodology Appendix 12-1 EIAR).</i></p> <p>The Proposed Development is seen in the background of the view at as distance sufficient to result in a low level of change in terms of the scenic amenity attributable to this view. The turbines do not obstruct the views of the Blackwater Valley and are seen as relatively small background elements.</p>
Significance of Effect	<p>Medium x Slight = Minor = Slight (EPA, 2022) An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.</p>
Mitigation Factors	<ul style="list-style-type: none"> ➤ The distance of the viewpoint from the Proposed Development reduces the scale of the turbines, which appear as background elements within the view. ➤ Sparsely populated section of road and there are limited numbers of nearby residential properties. ➤ The turbines are viewed within the background of the view, above the skyline and do not obstruct the views of a scenic quality of the Blackwater River valley and surrounds. ➤ The turbines are seen above tracts of coniferous plantation forestry which are a large-scale human intervention in the landscape. ➤ There is substantial screening of the turbines, with only turbine blades and hubs visible above the intervening topography.
Residual Effect (incl. mitigating factors)	<p>Not Significant (EPA, 2022) An effect which causes noticeable changes in the character of the environment but without significant consequences.</p>

Viewpoint 22 – Dromore Viewpoint			
Viewpoint Description and Details	<ul style="list-style-type: none"> ➤ View is from a local road adjacent to the Dromore Viewpoint, in the townland of Dromore. Dromore Viewpoint is a designated scenic viewpoint in the Draft Waterford County Development Plan 2022-2028. ➤ This viewpoint is located approximately 6.4 km north-east of the nearest proposed turbine (T1). ➤ Grid Reference: E 609,634, N 590,678 ➤ No. of turbines visible: 10/17 		
LCA and Sensitivity	Provisional LCA 2 River Valleys and Lowlands – High	Visual Receptor(s) and Sensitivity	Motorists – Low Residents – Low Scenic View – High

Viewpoint 22 – Dromore Viewpoint	
Description of 'Baseline'	The foreground of the view is comprised of a low-quality road leading to field entrances, bordered by low hedgerow made up of grasses and scrub, and interspersed with deciduous trees. The view looks over an agricultural field sloping downwards and allowing long range views over the surrounding countryside. This field is defined by the hedgerow running along the border. Views towards the left background are greatly constrained by the rising topography and hedgerow forming the border between the road and the adjacent field. To the right background, views of the southern side of the valley formed by the River Bride can be seen in the right background, although the river itself is out of view from this location. In the centre background the far side of the slopes of the Blackwater Valley and the countryside beyond this can be observed, with land use primarily relating to agriculture and commercial forestry, along with some tracts of deciduous woodland. Commercial forestry becomes a more frequent land use towards the left-hand side of the view. The ridgeline seen in the background is completely covered in coniferous monoculture forestry.
Proposed Photomontage Description	Turbines from the eastern cluster are seen to the left-hand side of the centre background and turbines from the western cluster are seen to the right-hand side of the centre background and appear slightly smaller than the western cluster. The two clusters of turbines are visually separated in the view, however, all turbines are generally evenly spaced and the layouts are coherent and appropriate for this landscape type. There is some screening of the turbine towers of certain turbines by the topography and coniferous plantation forestry. In addition, six turbines are completely screened by the intervening topography, with a further turbine completely screened by the intervening hedgerow.
Cumulative Effects	The existing Barranafaddock turbines, and the existing Woodhouse turbines are visible from this general location, however, it is noted that both of these existing wind farms are not within the horizontal extent of the views shown here. The existing Woodhouse turbines are located in the opposite direction to the proposed turbines, creating a combined (in succession – where an observer has to turn their head to see the various development.) view of turbines from this location. The existing Barranafaddock turbines are seen approximately 53 degrees clockwise (to the right-hand side of the rightmost proposed turbine in this view) from this viewpoint. This also creates a combined, in succession, view of turbines from this location. The Barranafaddock turbines are located approximately 20.5km from this viewpoint and are not actually visible in this image given the atmospheric conditions.
Sensitivity of Visual Receptor(s)	Medium: While this view is located proximate to a designated scenic viewpoint in the Draft Waterford County Development Plan, the main focus of this view is to the north, where there are views of a far-higher scenic quality available. (see the discussion in the landscape response). In addition, the view shown in this photomontage is not representative of views from the main viewing area for this designated view, where there will be additional screening provided by the mature hedgerows that line the side of the road directed towards the Proposed Development from the designated viewpoint.
Magnitude of Change	Slight: <i>“The proposals would be partially visible or visible at sufficient distance to be perceptible and result in a low level of change in the view</i>

Viewpoint 22 – Dromore Viewpoint	
	<p><i>and its composition and a low degree of contrast. The character of the view may be altered, but will remain similar to the baseline existing situation. This change could be short term or of a short duration.” (LVIA Methodology Appendix 12-1 EIAR).</i></p> <p>The Proposed Development is seen in the background of the view at a distance sufficient to result in a low level of change in terms of the scenic amenity attributable to this view. The turbines do not interfere with the views of the Blackwater Valley and are seen as relatively small background elements.</p>
Significance of Effect	<p>Medium x Slight = Minor = Slight (EPA, 2022) An effect which causes noticeable changes in the character of the environment without affecting its sensitivities</p>
Mitigation Factors	<ul style="list-style-type: none"> ➤ The main focus of this designated scenic view is to the north, away from the Proposed Development (south-west). There are other turbines (Barranafaddock) located closer towards the main focus of the scenic view over the river valley, with the turbines of the Proposed Development located further outside of the field of view in this direction. ➤ The distance of the viewpoint from the Proposed Development reduces the scale of the turbines, which appear as background elements within the view. ➤ Sparsely populated section of road and there are limited numbers of nearby residential properties. ➤ The turbines are viewed within the background of the view, above the skyline and do not interfere with the views of a scenic quality of the Blackwater River and surrounds (main views of which are in the other direction). ➤ The turbines are seen above tracts of coniferous plantation forestry which are a large-scale human intervention in the landscape.
Residual Effect (incl. mitigating factors)	<p>Not Significant (EPA, 2022) An effect which causes noticeable changes in the character of the environment but without significant consequences.</p>

Viewpoint 23 – D’Loughtane	
Viewpoint Description and Details	<ul style="list-style-type: none"> ➤ View is from D’Loughtane House, a cultural heritage site in the townland of D’Loughtane. ➤ This viewpoint is located approximately 6.4 km south-east of the nearest turbine (T6). ➤ Grid Reference: E 609,884, N 583,255 ➤ No. of turbines visible: 10/17

Viewpoint 23 – D'Loughtane			
LCA and Sensitivity	Provisional LCA 2 River Valleys and Lowlands – High	Visual Receptor(s) and Sensitivity	Residents – Low Cultural Heritage – Medium (not open to public)
Description of 'Baseline'	<p>The foreground view looks over a metal fence onto an agricultural pastureland field. This field slopes gently downwards from left to right. The field is bordered by a treeline consisting of a mixture of deciduous and coniferous trees, providing screening of the adjacent lands. However, the topography continues to slope downwards resulting in long-range views over the landscape on the opposite side of the River Blackwater (which is out of view in this image). The landscape here, seen throughout the background of the image, is gently undulating with the topography forming a ridgeline in the background. The landcover here is primarily agricultural land, with the field patterns defined by mature hedgerows interspersed with trees. Large tract of coniferous plantation forestry can be seen in the centre and left background.</p>		
Proposed Photomontage Description	<p>There are ten turbines visible from mid-tower up, with nine turbine hubs fully visible. The blades of one additional turbine can also be seen above the skyline of the view. The remaining turbines are completely screened from view by the intervening topography and forestry. The turbines are evenly spaced along the ridgeline (where visible) and appear as a coherent layout, well absorbed in the landscape within which they are viewed. All turbines are viewed within the same viewing direction as the commercial forestry seen along the ridgeline in this view. This reduces the level of interference that the proposed turbines cause within the higher-quality part of this view.</p>		
Cumulative Effects	No other wind farms are visible, there are no cumulative visual effects.		
Sensitivity of Visual Receptor(s)	Medium – This viewpoint represents a sensitive cultural heritage site, although this is located on private lands and access is not generally available to the public.		
Magnitude of Change	<p>Slight: <i>“The proposals would be partially visible or visible at sufficient distance to be perceptible and result in a low level of change in the view and its composition and a low degree of contrast. The character of the view may be altered, but will remain similar to the baseline existing situation. This change could be short term or of a short duration.” (LVIA Methodology Appendix 12-1 ELAR).</i></p> <p>The Proposed Development is seen in the background of the view at as distance sufficient to result in a low level of change in terms of the scenic amenity attributable to this view. The turbines do not obstruct the views of the Blackwater Valley and are seen as relatively small background elements.</p>		
Significance of Effect	<p>Medium x Slight = Minor = Slight (EPA, 2022) An effect which causes noticeable changes in the character of the environment without affecting its sensitivities</p>		
Mitigation Factors	<p>➤ Open views towards the Proposed Development from the immediate setting of the house were found to be limited. The photomontage</p>		

Viewpoint 23 – D’Loughtane	
	<p>presented here is captured from an elevated vantage point in proximity to the house where open views were available, however it does not represent views from the house itself.</p> <ul style="list-style-type: none"> ➤ A substantial number of the turbines are screened from view by the intervening topography and commercial forestry. ➤ The distance of the viewpoint from the Proposed Development reduces the scale of the turbines, which appear as background elements. ➤ The turbines are seen above the skyline of the view in a coherent layout. ➤ The turbines are viewed within the background of the view, above the skyline and do not obstruct the views of the Blackwater Valley ➤ The turbines are seen above tracts of coniferous plantation forestry which are a large-scale human intervention in the landscape. ➤ Siting and design were developed in accordance with the guidelines for Hilly and Flat Farmland landscape character type.
Residual Effect (incl. mitigating factors)	<p>Slight (EPA, 2022) An effect which causes noticeable changes in the character of the environment without affecting its sensitivities</p>

Viewpoint 24 – Ballynaraha			
Viewpoint Description and Details	<ul style="list-style-type: none"> ➤ View is from Ballynaraha Castle, a cultural heritage site in the townland of Kilmacarriga. ➤ This viewpoint located on private lands with no public access available. ➤ This viewpoint is located approximately 6.7 km north of the nearest turbine (T1). ➤ Grid Reference: E 605,959, N 594,095 ➤ No. of turbines visible: 1/17 		
LCA and Sensitivity	Provisional LCA 2 River Valleys and Lowlands – High	Visual Receptor(s) and Sensitivity	Residents – Low Cultural Heritage – Medium (not open to public)
Description of ‘Baseline’	<p>The foreground of the view looks over a residential dwelling and garden, within which Ballynaraha Castle is located. The garden can be seen to be bordered by a timber post and wire fence, on the other side of which is pasture field that slopes steeply downwards in the left midground. A line of mature deciduous trees borders this field on all sides. While the topography of the downwards sloping field permits open views over the surrounding landscape of the valley formed by the River Bride. Although, views of this landscape are constrained by the mature treeline surrounding the pasture field. The landcover of the landscape in the background is primarily agricultural fields defined by hedgerows, and tracts of commercial plantation forestry, which are sometimes bordered by treelines of deciduous native species. The ridgeline in the background of the view is primarily covered by this forestry. The view is long-ranging in the centre and left background, in the direction of the Blackwater Valley.</p>		

Viewpoint 24 – Ballynaraha	
Proposed Photomontage Description	One turbine hub can be seen in the centre background, behind the ridgeline seen in the centre and left background of the view. The remainder of the turbines are screened from view by the mature treeline surrounding the pasture field in the midground. The one turbine in view appears as a small background element, located behind the ridgeline in the background, greatly limiting the level of interference in the view created by the addition of the proposed turbine. It is noted that the wireframe image is incorporated into the determination of effects below given that in winter months there will be less foliage on the intervening vegetation, allowing potentially more visibility of the Proposed Development.
Cumulative Effects	No other wind farms are visible, there are no cumulative visual effects.
Sensitivity of Visual Receptor(s)	Medium – This viewpoint represents a sensitive cultural heritage site, although this is located on private lands and access is not generally available to the public.
Magnitude of Change	<p>Negligible – <i>“Any change would only be barely distinguishable from the status quo “do-nothing scenario” in the surroundings. The composition and character of the view would be substantially unaltered, approximating to little or no change.” (LVIA Methodology Appendix 12-1 EIAR).</i></p> <p>The turbines are substantially screened by the intervening vegetation and appear as background elements within the view. There will therefore be a barely distinguishable change in the status quo and the composition and character of the view will remain substantially unaltered.</p>
Significance of Effect	<p>Medium x Negligible = Minor/Negligible = Not Significant (EPA, 2022)</p> <p>An effect which causes noticeable changes in the character of the environment but without significant consequences.</p>
Mitigation Factors	<ul style="list-style-type: none"> ➤ Ballynaraha Castle is actually located behind this viewpoint location where the residential property adjacent to the viewpoint will entirely screen the Proposed Development from view. This was confirmed using an early-stage photomontage captured from directly outside the castle itself where it was found that no visibility of the Proposed Development would occur. ➤ The distance of the viewpoint from the Proposed Development reduces the scale of the turbines, which appear as background elements within the view. ➤ The turbines are viewed within the background of the view, above the skyline and do not interfere with the background views of the rural countryside. ➤ The turbines are seen above tracts of coniferous plantation forestry which are a large-scale human intervention in the landscape. ➤ The majority of the turbine components are screened by the topography and intervening vegetation
Residual Effect (incl. mitigating factors)	<p>Imperceptible (EPA, 2022)</p> <p>An effect capable of measurement but without significant consequences</p>

Viewpoint 25 – O’Kyle			
Viewpoint Description and Details	<ul style="list-style-type: none"> ➤ View is from a local road the townland of O’Kyle. ➤ This Viewpoint is located 6.7km north of the nearest turbine (T1). ➤ Grid Reference: E 607,521, N593,424 ➤ No. of turbines visible: 7/17 		
LCA and Sensitivity	Provisional LCA 2 River Valleys and Lowlands – High	Visual Receptor(s) and Sensitivity	Residents – Low Motorists – Low
Description of ‘Baseline’	<p>The foreground of the view is comprised of a residential dwelling in the right foreground, with an adjoining garden with long grasses bordered by a low hedgerow interspersed with deciduous trees in the left foreground and midground. There are long-range open views of the Blackwater Valley in the left background, with views of the river itself available. The valley itself is defined by the undulating slopes of the valley that transition into a flat ridgeline towards the centre background. The land cover here is primarily agricultural fields bordered by deciduous treelines and hedgerows, with some commercial forestry visible in the centre and right background. The valley seen in the centre background is created by the River Bride. The longest-ranging views of a higher scenic quality are seen to the left-hand side of the image and beyond.</p>		
Proposed Photomontage Description	<p>There are four turbines of the eastern cluster seen to the left-hand side of the extent of the Proposed Development, in the centre background, with partial screening of the towers of these turbines by the forestry located along the ridgeline. In addition, the blade tips of three turbines from the western cluster are visible above the ridgeline, to the right-hand extent of the Proposed Development. The majority of the turbines are screened by the intervening topography and commercial forestry. The visible turbines appear as small background elements with good spacing and a coherent layout. The turbines are seen outside of the focus of the view, which is primarily directed towards the Blackwater Valley (to the left-hand side of the image), with the river and valley providing scenic amenity to this part of the view. While the Proposed Development is located within a similar direction and will be noticeable within views in this direction, there is a degree of visual separation between the location of the Proposed Development and the Blackwater Valley itself.</p>		
Cumulative Effects	<p>The existing Woodhouse WF turbines are visible from this location, however, it is noted that this wind farms is not within the horizontal extent of the views shown here. The existing Woodhouse turbines are located in the opposite direction to the proposed turbines, creating a combined (in succession – where an observer has to turn their head to see the various development.) view of turbines from this location. The Woodhouse turbines are viewed on the other side of the Blackwater Valley.</p>		
Sensitivity of Visual Receptor(s)	<p>Medium - This viewpoint is located along a small local road with likely low levels of traffic. There are residential dwellings located nearby with their views in the direction of the Proposed Development, although these are located a substantial distance from the Proposed Development itself. There are long-ranging views of scenic quality available from this location (over the Blackwater Valley).</p>		

Viewpoint 25 – O’Kyle	
Magnitude of Change	<p>Slight: “The proposals would be partially visible or visible at sufficient distance to be perceptible and result in a low level of change in the view and its composition and a low degree of contrast. The character of the view may be altered, but will remain similar to the baseline existing situation. This change could be short term or of a short duration.” (LVIA Methodology Appendix 12-1 EIAR).</p> <p>The turbines occupy a small vertical and horizontal extent within this view and their addition to the view results in a low level of change in terms of the scenic amenity attributable to this view, given that they do not obstruct or substantially interfere with the long-distance views over the Blackwater Valley. In addition, the turbines are seen as background elements within the view.</p>
Significance of Effect	<p>Medium x Slight = Minor = Slight (EPA, 2022) An effect which causes noticeable changes in the character of the environment without affecting its sensitivities</p>
Mitigation Factors	<ul style="list-style-type: none"> ➤ The majority of the turbines are screened from view by the intervening topography and commercial forestry. ➤ The distance of the viewpoint from the Proposed Development reduces the scale of the turbines, which appear as background elements. ➤ The turbines are seen as set-back from this location due to the distances involved and are seen above the skyline of the view in a coherent, ordered layout. ➤ The turbines are viewed within the background of the view, above the skyline and do not obstruct the views of the Blackwater Valley. ➤ There is a degree of visual separation between the Blackwater Valley and the Proposed Development. ➤ The Proposed Development is viewed as an ordered and coherent array of turbines from this perspective.
Residual Effect (incl. mitigating factors)	<p>Slight (EPA, 2022) An effect which causes noticeable changes in the character of the environment without affecting its sensitivities</p>

Viewpoint 26 – Lisfinney House			
Viewpoint Description and Details	<ul style="list-style-type: none"> ➤ View is from Lisfinney House, a cultural heritage site in the townland of Lisfinney. ➤ This viewpoint is located approximately 6.2 km north of the nearest turbine (T12). ➤ Grid Reference: E 599,131, N 594,618 ➤ No. of turbines visible: 10/17 		
LCA and Sensitivity	Provisional LCA 2 River Valleys and Lowlands – High	Visual Receptor(s) and Sensitivity	Residents – Low Cultural Heritage – Medium (located on private lands)

Viewpoint 26 – Lisfinney House	
Description of 'Baseline'	Lisfinney Castle can be seen in the left foreground, rising above the top of the image shown, with the roof of a stables seen connected to the tower. To the right of the stables two large coniferous trees can be seen in the right midground, these trees completely obstruct longer-range views in this direction. A scenic long-range view is available over the stables in the centre background, where the landscape and valley surrounding the River Bride can be seen. Landcover here is comprised of agricultural fields, with the settlement of Tallow also visible in the left-centre background. The topography is gently undulating, and large tracts of commercial forestry can be seen atop the ridgeline formed by the hills seen in the far background of the view.
Proposed Photomontage Description	<p>The western cluster of turbines is visible in the right-centre background, with the turbines seen aligned in a neat line across the ridgeline formed by the topography. There are six turbine hubs visible here decreasing levels of turbine towers visible as the view tracks left. These turbines are seen above a tract of commercial plantation forestry and are background elements occupying a limited vertical and horizontal extent within the view.</p> <p>The eastern cluster of turbines is also visible in the left-centre background, with the blades of four turbines seen above the skyline, which is currently comprised of commercial plantation forestry.</p>
Turbine Range Assessment	It is noted that additional photomontages were produced showing a differing turbine configuration, the 'Lowest Hub and Longest Blade'. The difference between this configuration and the 'Highest Hub and Shortest Blade' is negligible in terms of visual effects, demonstrating that differences between differing turbine configuration within the range stated is negligible from a landscape and visual perspective.
Cumulative Effects	No other wind farms are visible, there are no cumulative visual effects.
Sensitivity of Visual Receptor(s)	Medium – This viewpoint is located at a sensitive cultural heritage site, although the nature of the site suggests that it is not a popular tourist or visitor destination. There are also a number of residential receptors represented by this viewpoint, although these are located a substantial distance from the Proposed Development.
Magnitude of Change	<p>Slight: <i>“The proposals would be partially visible or visible at sufficient distance to be perceptible and result in a low level of change in the view and its composition and a low degree of contrast. The character of the view may be altered, but will remain similar to the baseline existing situation. This change could be short term or of a short duration.” (LVIA Methodology Appendix 12-1 ELAR).</i></p> <p>The proposed turbines are seen as small background elements within the view and are viewed above the ridgeline in the background. The turbines occupy a small vertical and horizontal extent and despite the two clusters appearing visually separate within the view, there are very limited views of the eastern cluster.</p>

Viewpoint 26 – Lisfinney House	
Significance of Effect	Medium x Slight = Minor = Slight (EPA, 2022) An effect that alters the character of the environment in a manner consistent with existing and emerging baseline trends
Mitigation Factors	<ul style="list-style-type: none"> ➤ Optimal views of Lisfinney Castle in its setting are from locations to the south-east, where the Proposed Development will be located in the opposite direction. This viewpoint is taken from outside the castle but is located on private lands with likely low numbers of visitors. ➤ The majority of the turbine components are substantially screened from view by the intervening topography and vegetation. ➤ The layout of the western cluster is neat and evenly spaced, appearing coherent within the landscape. ➤
Residual Effect (incl. mitigating factors)	Slight (EPA, 2022) An effect which causes noticeable changes in the character of the environment without affecting its sensitivities

Viewpoint 27 – Villierstown			
Viewpoint Description and Details	<ul style="list-style-type: none"> ➤ View is from the intersection of two local roads within Villierstown village, in the townland of Villierstown. ➤ This viewpoint is located approximately 8.4 km north-east of the nearest proposed turbine (T1). ➤ Grid Reference: E 610,310, N 592,806 ➤ No. of turbines visible: 15/17 		
LCA and Sensitivity	Provisional LCA 2 River Valleys and Lowlands – High	Visual Receptor(s) and Sensitivity	Motorists – Low Residents – Low Cyclists – Medium
Description of ‘Baseline’	The foreground of the view is comprised of a low stone wall which forms the boundary for a residential property. Various man-made vertical elements can be seen along the local road in view including electricity and phone lines, along with lampposts and signage along the roadway. In the left midground several types of vegetation including a mature hedgerow, a mature treeline and other vegetation combine to completely obstruct longer-range views in this direction. This is similarly the case with the right midground, where a line of mature deciduous trees obstruct longer-ranging views. A distant hill comprising a vegetated agricultural landscape is visible in the centre background of the view. The character of the view is suburban to rural, with the majority of the view characterised by development on the outskirts of the village of Villierstown.		
Proposed Photomontage Description	The turbines of the Proposed Development are seen above the ridgeline in the centre background. Nine turbine hubs and blades of the eastern cluster of turbines can be seen to the left-centre background, with a degree of visual separation between these turbines and the blades of the turbines of the western cluster, seen to the right-centre background. All visible proposed		

Viewpoint 27 – Villierstown	
	turbines are seen above the skyline of the view, reducing the level of visual confusion introduced by the Proposed Development, although the overlap between the turbines and the electricity lines introduces a certain level of visual confusion. The two clusters of turbines are visually separated in the view; however, the layouts are coherent and appropriate for this landscape type. The turbines are seen as small background elements within the view.
Cumulative Effects	No other wind farms are visible, there are no cumulative visual effects.
Sensitivity of Visual Receptor(s)	Medium: Visual receptors include residents located a substantial distance from the Proposed Development and road users, along with cyclists using the Sean Kelly Cycle Route.
Magnitude of Change	<p>Slight: <i>“The proposals would be partially visible or visible at sufficient distance to be perceptible and result in a low level of change in the view and its composition and a low degree of contrast. The character of the view may be altered, but will remain similar to the baseline existing situation. This change could be short term or of a short duration.” (LVIA Methodology Appendix 12-1 EIAR).</i></p> <p>The Proposed Development is seen in the background of the view at a distance sufficient to result in a low level of change in terms of the scenic amenity attributable to this view. The turbines are seen as relatively small background elements and the composition of the view would be substantially unaltered as a result of the addition of the Proposed Development.</p>
Significance of Effect	<p>Medium x Slight = Minor = Slight (EPA, 2022)</p> <p>An effect which causes noticeable changes in the character of the environment without affecting its sensitivities</p>
Mitigation Factors	<ul style="list-style-type: none"> ➤ The distance of the viewpoint from the Proposed Development reduces the scale of the turbines, which appear as small background elements within the view. ➤ The proposed turbines are substantially obscured from view by the intervening ridgeline and vegetation. ➤ The turbines appear within a small horizontal extent within the view. ➤ The availability of open views from within Villierstown is extremely limited and the view shown here is one of the most open views available from the village.
Residual Effect (incl. mitigating factors)	<p>Not Significant (EPA, 2022)</p> <p>An effect capable of measurement but without significant consequences</p>

Viewpoint 28 – R627 Regional Road	
Viewpoint Description and Details	<ul style="list-style-type: none"> ➤ View from the R627 regional road in the townland of Glengoura Upper.

Viewpoint 28 – R627 Regional Road			
	<ul style="list-style-type: none"> > This viewpoint is located approximately 2.2 km north-west of the nearest turbine (T13). > Grid Reference: E 597,535, N 589,306 > No. of turbines visible: 7/17 		
LCA and Sensitivity	LCT 10b Fissured Fertile Middleground (Rylane east to Waterford) - Low	Visual Receptor(s) and Sensitivity	Motorists – Low Residents - Medium
Description of ‘Baseline’	<p>The foreground of the image looks over the R627 regional road, which is bordered on the far side by a low hedgerow. A medium size tree can be seen in the left foreground, partially obscuring the view. The low hedgerow permits views over the surrounding countryside which is generally located at a lower elevation than the regional road. The land cover in view throughout the background is comprised of agricultural fields, defined by the mature hedgerows that border them. The topography undulates gently in the left background and increases to steeper undulations towards the centre and right background, with a hill seen formed in the centre background. The landcover in the centre and right background is more heavily comprised of tracts of commercial monoculture forestry. There are longer-range views of more distant hills available in the right background.</p>		
Proposed Photomontage Description	<p>There are five turbine hubs visible from this location, with one turbine fully visible in the centre background. There are two additional turbines mostly screened by the deciduous tree seen in the centre foreground, but this screening effect will differ depending on the exact viewing location. The turbines occupy a relatively small horizontal and vertical extent within the view. They are viewed above the tracts of commercial forestry and the ridgeline seen in the centre background. It is also noted that one of the turbines in the western cluster is completely screened by the deciduous tree seen in the left foreground, however, this screening effect will differ depending on exact viewing location and this turbine (seen in the wireframe) is also considered visible from this Viewpoint.</p>		
Cumulative Effects	No other wind farms are visible, there are no cumulative visual effects.		
Sensitivity of Visual Receptor(s)	Low – Visual receptors include motorists traveling along the regional road and nearby residential receptors located a large distance from the Proposed Development.		
Magnitude of Change	<p>Moderate: <i>“The change in the view may involve partial obstruction of existing view or partial change in character and composition of the baseline through the introduction of new elements or removal of existing elements. Likely to occur at locations where the development is partially visible over a moderate or medium extent, and which are not in close proximity to the development. Change may be readily noticeable but not substantially different in scale and character from the surroundings and wider setting.” (LVIA Methodology Appendix 12-1 EIAR).</i></p> <p>The views of turbines are limited in their horizontal and vertical extent. There are no fundamental highly sensitive landscape features altered as a result of the addition of the Proposed Development into the view.</p>		

Viewpoint 28 – R627 Regional Road	
Significance of Effect	Low x Moderate = Minor = Slight (EPA, 2022) An effect which causes noticeable changes in the character of the environment without affecting its sensitivities
Mitigation Factors	<ul style="list-style-type: none"> ➤ Siting and design were developed in accordance with the guidelines for Hilly and Flat Farmland landscape character type. ➤ Sparsely populated section of road with limited numbers of residential receptors. ➤ The turbines are seen above the skyline of the view in a coherent layout. ➤ The turbines are seen above tracts of coniferous plantation forestry which are a large-scale human intervention in the landscape. ➤ This view will be fleeting for the majority of visual receptors using the regional road, with substantial levels of screening on the roadside along this stretch of road in close proximity to the Proposed Development.
Residual Effect (incl. mitigating factors)	Slight (EPA, 2022) An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.

Viewpoint 29 – R634 Breeda			
Viewpoint Description and Details	<ul style="list-style-type: none"> ➤ View from the R634 regional road in the townland of Breeda. This viewpoint is located along a designated scenic route in the Cork County Development Plan 2014. ➤ This viewpoint is located approximately 570m west of the nearest turbine (T5). ➤ There are views of turbines in two directions from this Viewpoint ➤ There are no residential receptors located at this viewpoint, with the nearest residential dwelling located greater than 450m away. Therefore, this viewpoint is not an accurate representation of a view experienced by the closest residential receptor and is representative of the scenic route. ➤ Grid Reference: E 602,613, N 586,856 ➤ No. of turbines visible: 15/17 		
LCA and Sensitivity	LCT 10b Fissured Fertile Middleground (Rylane east to Waterford) - Low	Visual Receptor(s) and Sensitivity	Motorists – Medium Scenic Route - High
Description of 'Baseline' (West)	The entrance to a residential dwelling and farm can be seen in the foreground, with the top of a low stone wall seen in the centre and right foreground, and a private road seen in the centre foreground. This road leads to a residential dwelling located approximately 450m away, seen in the left midground, along with a mature treeline and hedgerow surrounding the property. An agricultural pastureland field can be seen throughout the midground on either side of the private road. From the right background and midground to the centre midground, a large tract of commercial		

Viewpoint 29 – R634 Breeda	
	forestry can be seen, obstructing views in the right background. The topography is generally flat in the midground and foreground, but undulates more steeply in the background, with a landscape of rolling farmland seen in the left background. The upper regions of the rises in elevation are primarily covered in tracts of commercial forestry, with the lower regions comprised of agricultural fields. The character of the view in this direction is rural, although the views are generally unremarkable given the large-scale level of human intervention in the landscape (i.e. the substantial tracts of commercial monoculture forestry), particularly in the centre and right midgrounds and backgrounds.
Proposed Photomontage Description (West)	The western cluster of the proposed turbines can be seen in the background of the view, occupying a medium vertical and horizontal extent. There are six turbines seen from mid-tower up, along with the met mast, although this is a less noticeable feature given its slender frame. The turbines appear generally well spaced, with a coherent layout for the landscape type within which they are viewed. The turbines are situated above the commercial forestry within the view and do not obstruct any longer-range views.
Description of 'Baseline' (East)	The foreground of the view consists of a view of the regional road, which is bordered by a low hedgerow. A gap in the hedgerow leading to an agricultural grassland field is seen in the left midground. This field is seen above the hedgerow throughout the view. The roadside hedgerow can be seen to allow for intermittent views of the agricultural field and commercial forestry. The entirety of the background view is taken up by commercial monoculture forestry which screens any longer-range views in this direction. The view is of a rural character and is unremarkable in nature.
Proposed Photomontage Description (East)	The eastern cluster of the Proposed Development can be seen throughout the background of the view, with the closest turbine (T5) seen to occupy a large vertical extent within the view. In addition to T5, which can be seen almost in its entirety, there are six turbine hubs and the blades of two additional turbines visible above the commercial forestry. The turbines of the eastern cluster appear in two separate clusters from this location although it is noted that visual receptors will be traveling along the road, and this will be a fleeting view. The turbines are situated above the commercial forestry within the view and do not obstruct any longer-range views.
Cumulative Effects	Barranafaddock Wind Farm is potentially visible to the north from this location, although it is not visible in the images shown here as a result of atmospheric conditions. It will be partially seen as a minor background element and substantial cumulative visual effects are not deemed to arise.
Sensitivity of Visual Receptor(s)	Medium – As stated previously this view does not represent the view of any residential receptors and is likely only representative of motorists travelling along the regional road. While this is a designated scenic route there is limited scenic amenity attributable to this part of the view, considering it is a short-range view over a field towards commercial forestry.
Magnitude of Change	Substantial: <i>“Substantial change, where the proposals would result in large-scale, prominent or very prominent change, leading to substantial obstruction of existing view or complete change in character and composition of the baseline though removal of key elements or addition of</i>

Viewpoint 29 – R634 Breeda	
	<p><i>uncharacteristic elements which may or may not be visually discordant. This includes viewpoints where the proposed development is fully or almost fully visible over a wide extent, at close proximity to the viewer. This change could be long term or of a long duration.” (LVIA Methodology Appendix 12-1 EIAR).</i></p> <p>The views of turbines are partially screened by the commercial forestry. While there are views of the proposed turbines in two different directions, there are no fundamental highly sensitive landscape features altered or impacted as a result of the addition of the Proposed Development into the view.</p>
Significance of Effect	<p>Medium x Substantial = Moderate = Significant (EPA, 2022) An effect, which by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.</p>
Mitigation Factors	<ul style="list-style-type: none"> ➤ Views towards the Proposed Development site are short-range views of commercial monoculture forestry and not of a high scenic value. ➤ Sparsely populated section of road and there are no residential properties represented by this viewpoint. ➤ The turbines are seen above the skyline of the view in a coherent layout. ➤ The turbines are seen above tracts of coniferous plantation forestry which are a large-scale human intervention in the landscape. ➤ In relation to the overall scenic route where this viewpoint is located, this section has a relatively low level of scenic quality in terms of views. ➤ Siting and design were developed in accordance with the guidelines for Hilly and Flat Farmland landscape character type.
Residual Effect (incl. mitigating factors)	<p>Moderate (EPA, 2022) An effect which causes noticeable changes in the character of the environment without affecting its sensitivities</p>



APPENDIX 2

3RD PARTY PHOTOMONTAGE CRITIQUE

Proposed Lyrenacarriga Wind Farm

Proposed Lyrenacarriga
Wind Farm





DOCUMENT DETAILS

Client: **RWE**

Project Title: **Proposed Lyrenacarriga Wind Farm**

Project Number: **170749-e**

Document Title: **Proposed Lyrenacarriga Wind Farm**

Document File Name: **Appendix 2 - 3rd Party PMs Photomontage Critique - D1 - 2022.06.17**

Prepared By: **MKO
Tuam Road
Galway
Ireland
H91 VW84**



Planning and
Environmental
Consultants

Rev	Status	Date	Author(s)	Approved By
01	Draft	2022.06.24	JS	
	Final	2022.9.28		

1. 3RD PARTY PHOTOMONTAGE CRITIQUE

1.1 Introduction

Point B of the Further Information request received by An Bord Pleanála states the following:

(B) You are requested to review the photomontages undertaken and submitted by a number of the observers and provide a viewpoint assessment for each.

Two separate but related issues arose in relation the requested review of the 3rd Party Photomontages submitted. An issue firstly arose with the review of this Photomontage Booklet as there were no coordinates provided for the exact locations of the viewpoints, hampering the ability to identify the exact locations where the images were captured and thus the ability to independently verify the accuracy of the Photomontages produced.

Secondly, it was discovered during a desk-based review of the Photomontage Booklet submitted by the 3rd party observers that there were inaccuracies in the turbine locations within the views shown. Upon review, and using the maps provided with the 3rd Party Photomontages showing each viewpoint location, it was discovered that the turbines were incorrectly positioned within many of the views shown. An example of this is shown below in relation to Viewpoint 6 and Viewpoint 7, where the proximity of the turbines within the view allows for easy illustration of the inaccuracy that is present throughout the photomontages.

1.2 Viewpoint 6

Contained within this section are number of images which demonstrate the inaccuracy of turbine locations within the 'Proposed' View from Viewpoint 6. Viewpoint 6 is located to the east of the eastern cluster, along a small local road and represents the view from a number of residential receptors located along the adjacent stretch of road. The approximate location of the Viewpoint is shown below in an extract from the 3rd party Photomontages Booklet. As can be seen from the map below in Figure 1-1, there are supposed to be five turbines visible within the horizontal extent of the 39.6-degree view shown, with turbine T08 (the central turbine of the five turbines in the view) located noticeably closer to the Viewpoint location than turbines T9 and T10. It is notable therefore, that in Figure 1-2 below, which shows an extract from the 3rd Part Photomontages Booklet that turbine T8 (the central turbine within that view) appears to be located behind the ridgeline in the image, whereas T9 and T10 (to the left-hand side of the image) appear closer than T8, contrary to what is displayed on the Map shown in Figure 1-1.

However, this incorrect rendering of turbines within the view is only a minor mistake in relation to the mistaken placement of turbines within the same view illustrated below. Figure 1-2 below is an image extract from the 3rd Party Photomontage booklet showing a 39.6-degree horizontal field of view of the Proposed Development from Viewpoint 6. It can be seen that the left-hand extent of the turbines within this view extends all the way onto the far side of the rise in elevation seen in the left background. Figure 1-3 below is a wireframe image prepared by MKO which shows the locations of the turbines in relation to the topography from Viewpoint 6. It is noted that the model prepared by MKO for this wireframe image uses the turbine locations indicated on the extracted map from the 3rd Party Photomontage booklet, Figure 1-1 below (which do align with the actual turbine locations for the Proposed Development). However, it can be clearly seen from this wireframe image that the turbines are incorrectly positioned within the 'Proposed' View contained in the 3rd Party Photomontage. As seen in the wireframe image, the left-hand extent of the turbines should begin on the right-hand side of the hill seen in the extract of the Proposed View and that is clearly not the case. A simple comparison between the wireframe image prepared MKO (it is also notable that no wireframe images accompanied the 3rd Party Photomontages) and the Proposed View shows that the turbines are incorrectly positioned and rendered within the view.

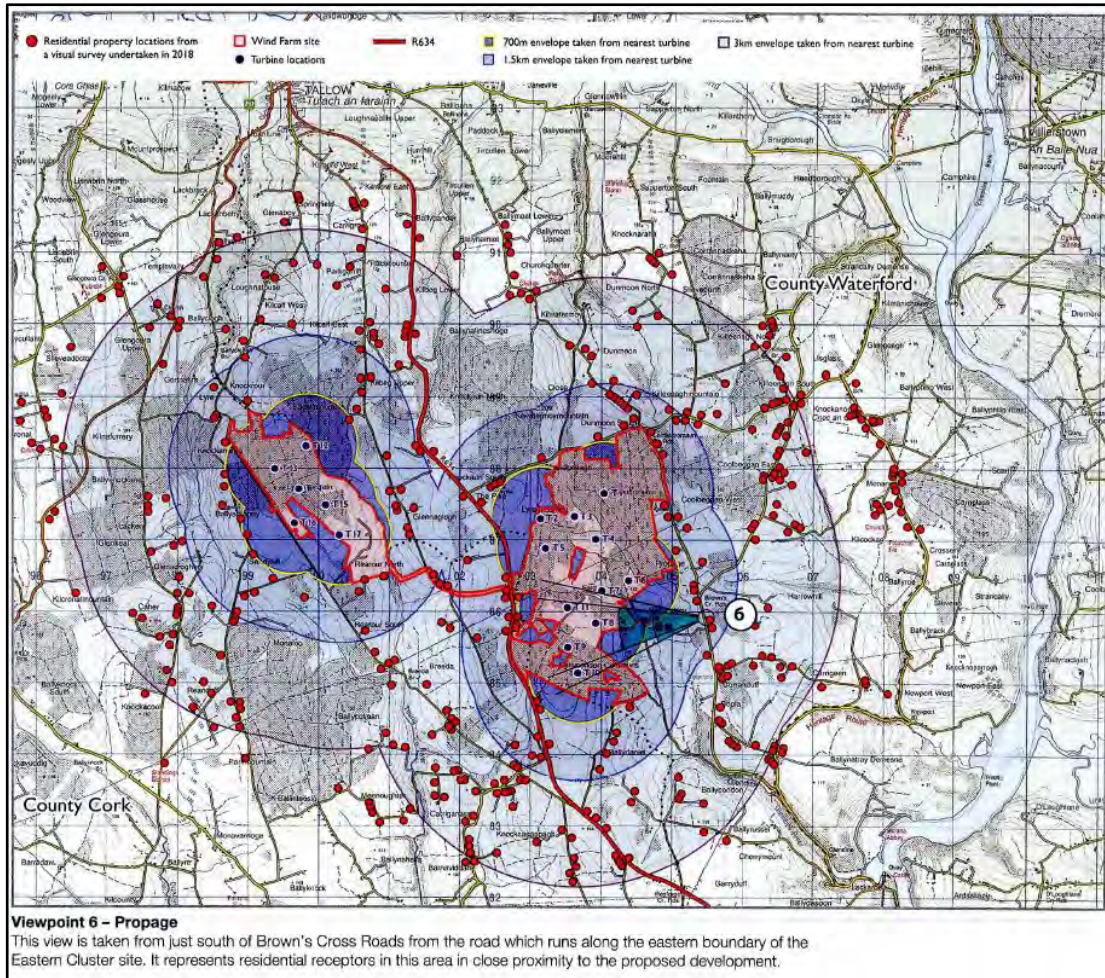


Figure 1-1 Extract from the 3rd Party Photomontage Booklet showing the location of Viewpoint 6 in relation to the proposed turbines

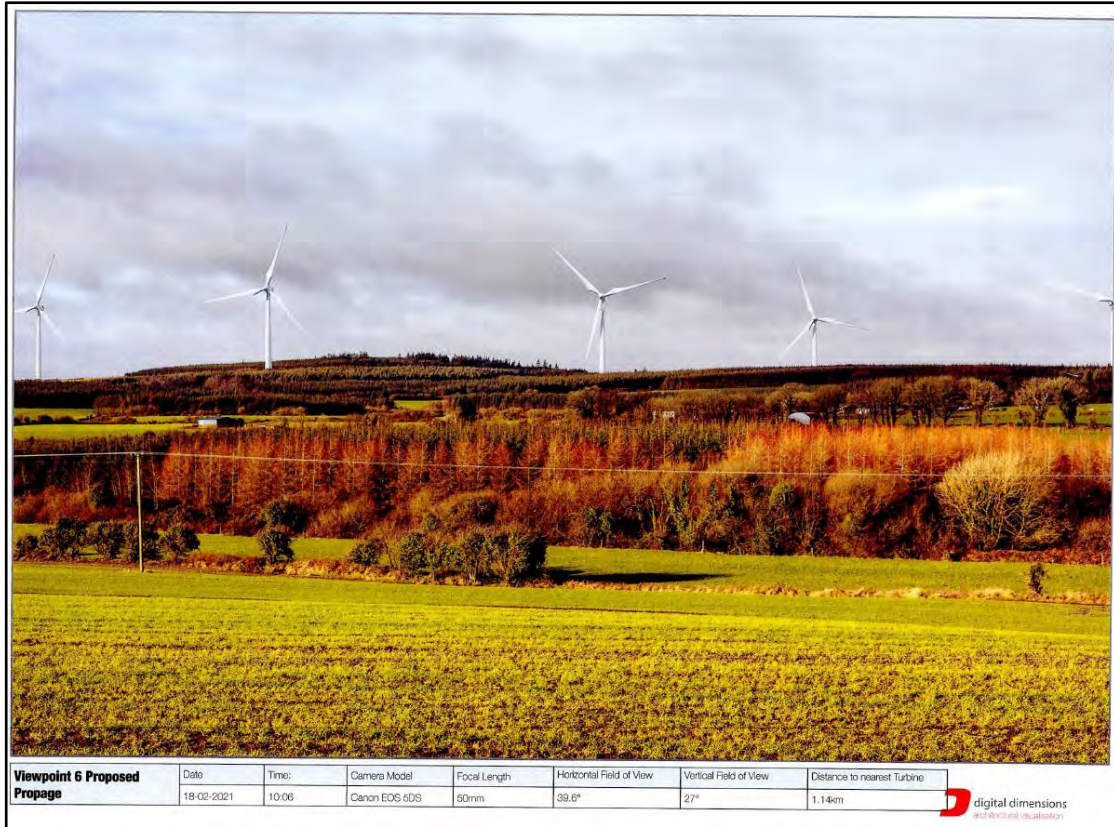


Figure 1-2 Extract from the 3rd Party Photomontage Booklet showing the 39.6 degree 'Proposed' View

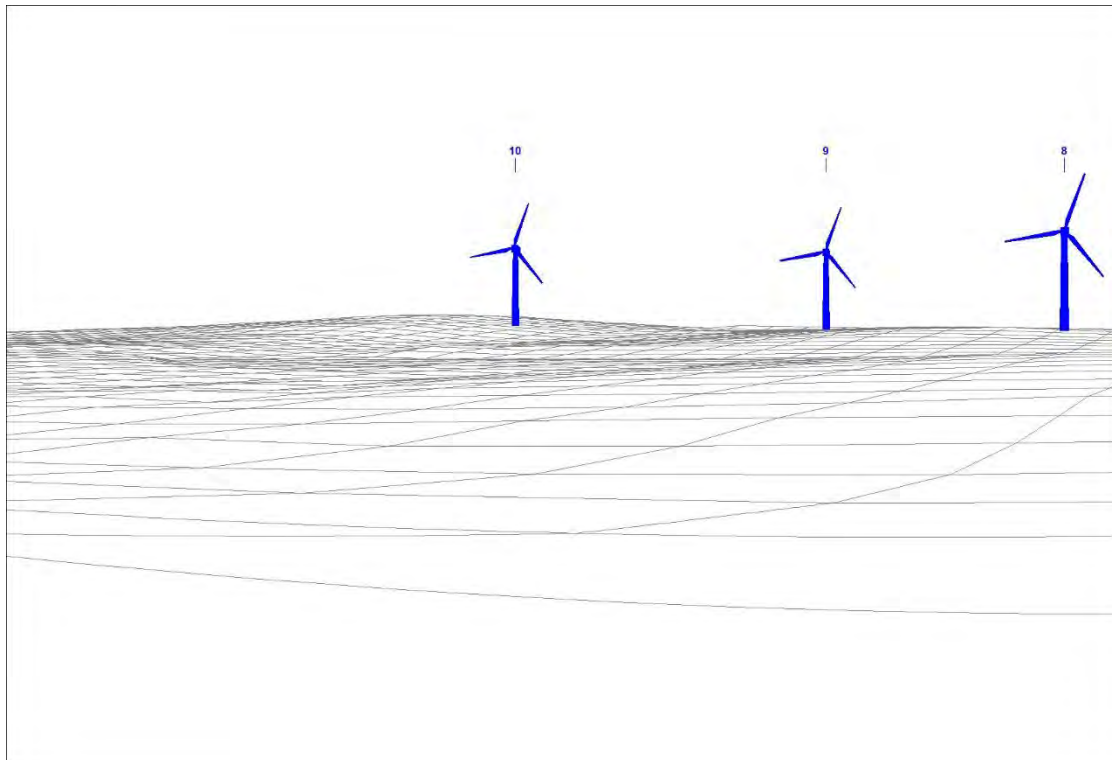


Figure 1-3 Wireframe Image Prepared by MKO showing the actual locations of the turbines in relation to the topography from this viewpoint location (Viewpoint 6)

1.3

Viewpoint 7

Contained within this section are number of images which demonstrate the inaccuracy of turbine locations within the 'Proposed' View from Viewpoint 7. Viewpoint 7 is located to the south of the eastern cluster of the turbines, along a small local road and represents the view from a number of residential receptors located along the adjacent stretch of road. The approximate location of the Viewpoint is shown below in an extract from the 3rd party Photomontages Booklet. As can be seen from the map below in Figure 1-4 there are potentially 9 turbines visible within the 39.6-degree horizontal extent of the Proposed view, with T10 and T9 almost perfectly aligned within the left-hand side of the view and turbine T8 located in the right-hand side of the view. These three turbines are located closest to the viewpoint and should therefore appear largest within the view. To reiterate, there should be two large turbines closely aligned in the left-hand side of the view, with one large turbine in the right-hand side of the view, at the least. This is demonstrated in the wireframe image prepared by MKO from this viewpoint location (Viewpoint 7).

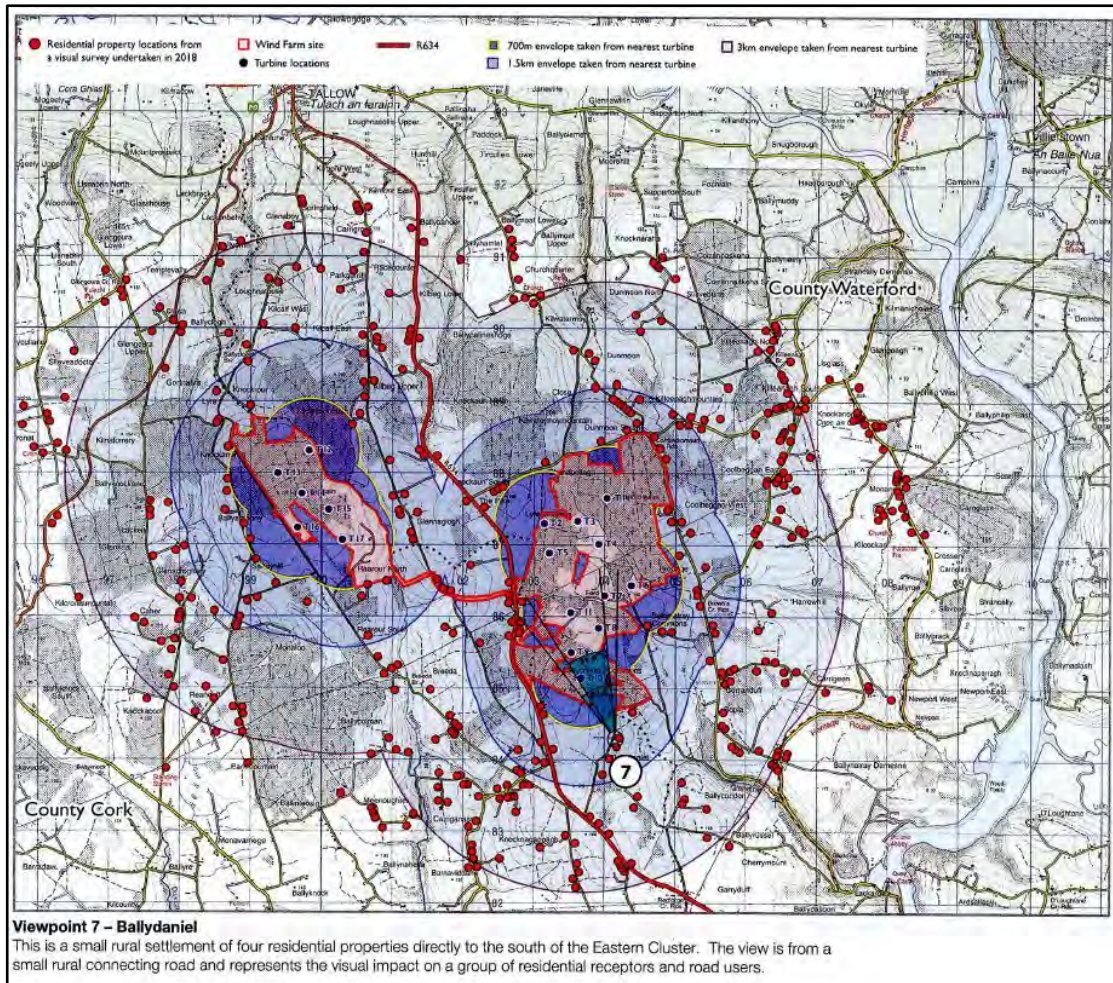


Figure 1-4 Extract from the 3rd Party Photomontage Booklet showing the location of Viewpoint 7 in relation to the proposed turbines



Figure 1-5 Extract from the 3rd Party Photomontage Booklet showing the 39.6 degree 'Proposed' View

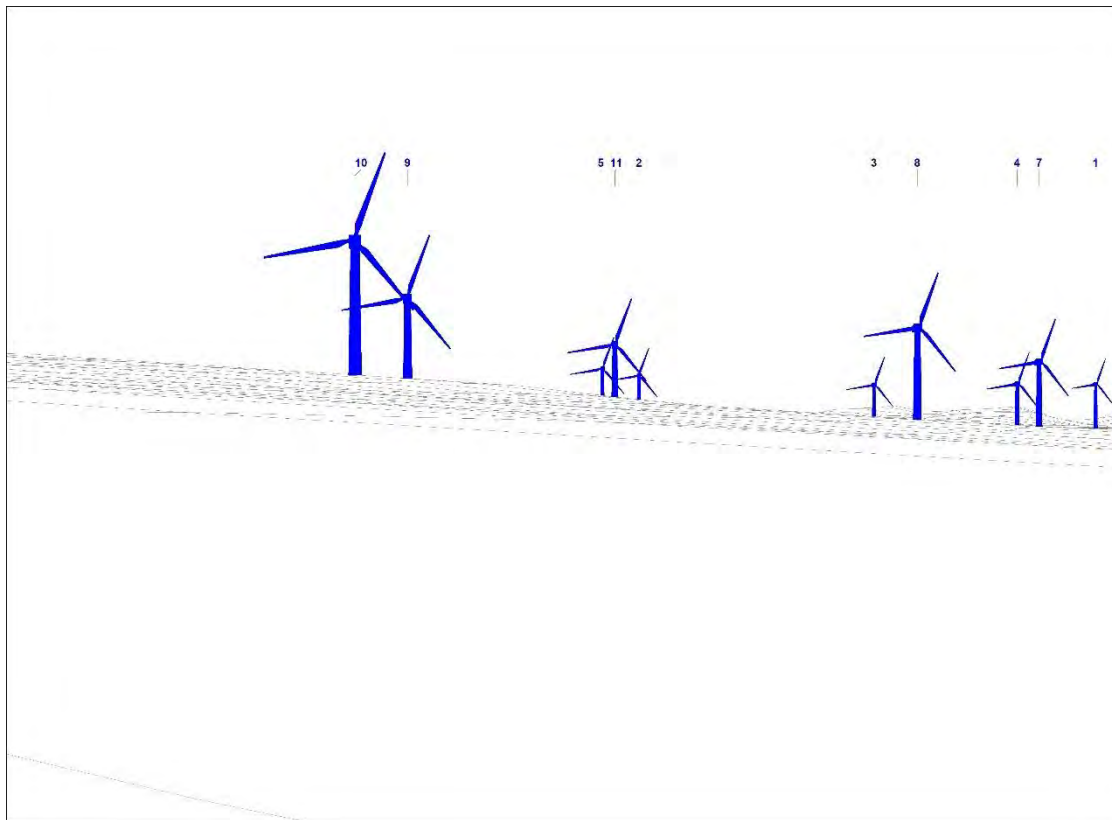


Figure 1-6 Wireframe Image Prepared by MKO showing the actual locations of the turbines in relation to the topography from this viewpoint location (Viewpoint 7)

It can be seen from Figure 1-6 above that from Viewpoint 7 turbines T10 and T9 (the two closest and thus largest) should be positioned close together within such a view, with the third closest turbine (T8)

positioned to the right of these within that same view. It can be seen clearly above in the extract of the Proposed Photomontage of Viewpoint 7 from the 3rd Party Photomontage Booklet (Figure 1-5) that turbines T10 and T9, which should be the largest turbines in such a view, are not located close to each other. Turbine T9, which is the second largest turbine, presumably the turbine seen to the right of the image below, is located much closer to T8, which does not match what the map above showing the turbine locations would suggest. There has clearly been an error with the placement of turbines the preparation of this Photomontage. A simple comparison between the wireframe image prepared MKO (it is also notable that no wireframe images accompanied the 3rd Party Photomontages) and the Proposed View shows that the turbines are incorrectly positioned and rendered within the view.

1.4

Summary

This error with turbines being placed incorrectly within proposed views is also apparent throughout the other photomontages submitted, although it is not considered necessary to detail every instance of incorrect placement of turbines in this document. Such an obvious error in the preparation of the photomontages raises strong doubts as to the use of these photomontages in determining the visual effects of the Proposed Development. Given that such an obvious flaw is easily apparent, the verification process that was conducted in the preparation of these photomontages must be questioned. These photomontages are clearly not an accurate depiction of the Proposed Development and in terms of relying on them to assess the visual effects, they are clearly not trustworthy. It is with this note of caution in mind that the assessment of the 3rd Party Photomontages is conducted (see Appendix 1 accompanying this response).

Finally, assessment of the Photomontages is conducted **as if** the Photomontages produced are accurate (which they are not). It is noted that no Significant Residual Visual Effects are deemed to arise as a result of this assessment. Further, it is not envisioned, in the professional judgement of the Landscape Team at MKO, that were the turbines placed correctly within these views it would result in a determination that Significant Residual Visual Effects would arise, as is consistent with the original landscape and visual impact assessment conducted.





APPENDIX 3

3RD PARTY PHOTOMONTAGE ASSESSMENT TABLES

Appendix 3 - 3rd Party Submitted Photomontages - Photomontage Assessment Tables

Proposed Lyrenacarriga
Wind Farm





DOCUMENT DETAILS

Client: **RWE**

Project Title: **Proposed Lyrenacarriga Wind Farm**

Project Number: **170749-e**

Document Title: **Appendix 3 - 3rd Party Submitted Photomontages -Photomontage Assessment Tables**

Document File Name: **Appendix 1 - 3rd Part PMs Photomontage Assessment Tables - D1 - 2022.05.26**

Prepared By: **MKO
Tuam Road
Galway
Ireland
H91 VW84**



Rev	Status	Date	Author(s)	Approved By
01	Draft	2022.05.26	JS	
	Final	2022.09.28		

1.

PHOTOMONTAGE ASSESSMENT TABLES

Note of Caution: It was discovered during a desk-based review of the Photomontage Booklet submitted by the 3rd party observers that there were inaccuracies in the turbine locations within the views shown. An issue firstly arose with the review of this Photomontage Booklet as there were no co-ordinates provided for the exact locations of the viewpoints, hampering the ability to identify the exact locations where the images were captured and thus the ability to independently verify the Photomontages produced. It was also discovered upon closer inspection, using the maps provided showing each viewpoint location (although these maps are at a scale and nature where it is not possible to identify the exact location, and the exact location is not described in the Photomontage Booklet submitted) that the turbines were incorrectly positioned within many of the views shown.

The flaws in these Photomontages are discussed and detailed in a separate appendix (Appendix 2) accompanying this document.

Such an obvious error in the preparation of the photomontages raises strong doubts as to the use of these photomontages in determining the visual effects of the Proposed Development. Given that such an obvious flaw is easily apparent, the verification process that was conducted in the preparation of these photomontages must be questioned. These photomontages are clearly not an accurate depiction of the Proposed Development and in terms of relying on them to assess the visual effects, they are clearly not trustworthy. It is with this note of caution in mind that the following assessment of the 3rd Party Photomontages is conducted.

The following assessment of the Photomontages is conducted **as if** the Photomontages produced are accurate (which **they are not**). It is noted that no Significant Residual Visual Effects are deemed to arise as a result of this assessment. Further, it is not envisioned, in the professional judgement of the Landscape Team at MKO, that were the turbines placed correctly within these views it would result in a determination that Significant Residual Visual Effects would arise, as is consistent with the original landscape and visual impact assessment conducted.

VP No.	Description	Grid Ref.
1	Description provided by 3 rd Party Observer: <i>“This viewpoint has been selected to show views from the north eastern quarter looking across the Blackwater River SAC with Camphire house in the foreground. It also represents receptors using the Sean Kelly Heritage Cycle Route and the scenic Dromona Drive.”</i>	Not provided by 3 rd Party Observer, assumed to be the following based on desk study and site visits: E 610,010 N 593,568
2	Description provided by 3 rd Party Observer: <i>“This viewpoint is above the Dromore Quay at a crossroads over-looking the river. It represents views looking west from the eastern bank of the Blackwater river and residential and visiting receptors.”</i>	Not provided by 3 rd Party Observer, assumed to be the following based on desk study and site visits: E 609,633 N 590,692
3	Description provided by 3 rd Party Observer: <i>“This viewpoint is further south on the east bank of the</i>	Not provided by 3 rd Party Observer, assumed to be

VP No.	Description	Grid Ref.
	<i>Blackwater river looking north west and represents residential receptors in this elevated area.”</i>	the following based on desk study and site visits: E 611,162 N 586,277
4	Description provided by 3 rd Party Observer: <i>“On the route of Waterford Scenic Route 4 and the Sean Kelly Heritage Cycle Route looking west towards the site just south of Knockanore. This viewpoint represents receptors using this scenic route and local residential receptors.”</i>	Not provided by 3rd Party Observer, assumed to be the following based on desk study and site visits: E 608,109 N 587,853
5	Description provided by 3 rd Party Observer: <i>“This viewpoint provides a mid-range view from just west of Knockanore looking across the settlement of Killeenagh South. It represents the impact for residential receptors and road users of a popular local road.”</i>	Not provided by 3rd Party Observer, assumed to be the following based on desk study and site visits: E 607,012 N 589,176
6	Description provided by 3 rd Party Observer: <i>“This view is taken from just south of Brown’s Cross Roads from the road which runs along the eastern boundary of the Eastern Cluster site. It represents residential receptors in this area in close proximity to the proposed development.”</i>	Not provided by 3rd Party Observer, assumed to be the following based on desk study and site visits: E 605,437 N 585,962
7	Description provided by 3 rd Party Observer: <i>“This is a small rural settlement of four residential properties directly to the south of the Eastern Cluster. The view is from a small rural connecting road and represents the visual impact on a group of residential receptors and road users.”</i>	Not provided by 3rd Party Observer, assumed to be the following based on desk study and site visits: E 604,091 N 584,396
8	Description provided by 3 rd Party Observer: <i>“This viewpoint is taken from a property on the R634 (Scenic section) at very close proximity to the development. It represents the visual impact that will be experienced by the residents and properties in the vicinity. It also represents views for road users on this scenic section of the R634.”</i>	Not provided by 3rd Party Observer, assumed to be the following based on desk study and site visits: E 602,708 N 586,246
9a & b	Description provided by 3 rd Party Observer: <i>“This viewpoint is on the R634 (Scenic Section) on the county boundary between Waterford and Cork between the two clusters of proposed turbines. It is a back to back view looking East (a) and West (b). It represents views for road users and residents living in the vicinity.”</i>	Not provided by 3rd Party Observer, assumed to be the following based on desk study and site visits: E 602,557 N 587,082

VP No.	Description	Grid Ref.
10	Description provided by 3 rd Party Observer: <i>“Glennaghough is a dispersed settlement on a minor road which runs between the two proposed development clusters. The view is looking west towards the Western Cluster. It represents the elevated impact that will be experienced by residential receptors in this area.”</i>	Not provided by 3rd Party Observer, assumed to be the following based on desk study and site visits: E 601,257 N 587,215
11	Description provided by 3 rd Party Observer: <i>“This viewpoint is from the minor road running to the west of the Western Cluster looking west. It represents local residents living in very close proximity to the nearest turbines.”</i>	Not provided by 3rd Party Observer, assumed to be the following based on desk study and site visits: E 598,978 N 586,903

Viewpoint 1 – North of Villierstown			
Viewpoint Description and Details	<ul style="list-style-type: none"> ➤ Description provided by 3rd Party Observer: <i>“This viewpoint has been selected to show views from the north eastern quarter looking across the Blackwater River SAC with Camphire house in the foreground. It also represents receptors using the Sean Kelly Heritage Cycle Route and the scenic Dromona Drive.”</i> ➤ View from a local road north of Villierstown in the townland of Dromana. ➤ It is noted for the sake of clarity that this location, while offering some long-range views of a scenic quality, is not a designated scenic route in the WCDP. ➤ Approximately 8.4 km north-east of the nearest turbine (T1). ➤ Grid Reference: Not provided by 3rd Party Observer, assumed to be the following based on desk study and site visits: E 610,010, N 593,568 ➤ No. of turbines visible: 14/17 		
LCA and Sensitivity	Provisional LCA 2 River Valleys and Lowlands – High	Visual Receptor(s) and Sensitivity	Motorists – Medium Residents – Medium Cyclists – Medium
Description of ‘Baseline’	<p>This view is captured from a small local road with a poor surface quality. The foreground of the view consists of an improved grassland field sloping downwards towards a hedgerow that borders the far end of the field. Beyond this a tract of woodland can be seen throughout the midground alongside the Blackwater River, which transects the midground. The landscape on the far side of the river is flat in close proximity to the river but rises and becomes more undulating further from the riverbank, in the background of the view. The landcover here is a mosaic of agricultural pastureland fields, deciduous woodland and large tracts of coniferous plantation forestry. Notably the skyline of the view is largely comprised of</p>		

Viewpoint 1 – North of Villierstown	
	coniferous forestry, a monoculture crop, with the natural focus of views from this location towards the river and flat surrounding lands, given their higher scenic value.
Proposed Photomontage Description	The turbines eastern cluster of the Proposed Development are seen clearly above the skyline of the view. Several of the turbine towers are somewhat screened by the intervening plantation forestry. There is some overlap of turbines components from this orientation, although it is noted that this will change depending on the exact viewing location. Some of the turbines blade tips of the western cluster of turbines are also visible from this location, in the right background, although these turbines are substantially screened from view. All turbines visible in this view are seen above the ridgeline in the background of the view, reducing the level of visual confusion introduced in this view as a result.
Cumulative Effects	No other wind farms are visible, there are no cumulative visual effects.
Sensitivity of Visual Receptor(s)	Medium: Motorists travelling along this route are likely low in numbers considering the quality of the roadway. There are limited numbers of residential receptors located near this viewpoint, with none actually located at this viewpoint. The nearby settlement of Villierstown will generally have less open views as the one shown in this Photomontage, given the higher levels of screening provided by the built infrastructure and vegetation present in the village. Cyclists along the Sean Kelly Heritage Cycle Route will be acting in a recreational capacity and are the primary reason for the this viewpoint being assigned a sensitivity of Medium, although it is noted that the cyclists will be primarily focused on views of the River itself, which the turbines do not interfere with.
Magnitude of Change	Slight: The proposals would be partially visible or visible at sufficient distance to be perceptible and result in a low level of change in the view and its composition and a low degree of contrast. The character of the view may be altered, but will remain similar to the baseline existing situation. This change could be short term or of a short duration. The Proposed Development is seen in the background of the view at a distance sufficient to result in a low level of change in terms of the scenic amenity attributable to this view. The turbines do not interfere with the views of the river Blackwater and are seen as relatively small background elements.
Significance of Effect	Medium x Slight = Minor = Slight (EPA, 2022) An effect which causes noticeable changes in the character of the environment without affecting its sensitivities
Mitigation Factors	<ul style="list-style-type: none"> ➤ Siting and design were developed in accordance with the guidelines for Hilly and Flat Farmland landscape character type. ➤ The distance of the viewpoint from the Proposed Development reduces the scale of the turbines, which appear as small background elements within the view. ➤ Sparsely populated section of road and there are limited numbers of nearby residential properties.

Viewpoint 1 – North of Villierstown	
	<ul style="list-style-type: none"> ➤ The turbines are viewed within the background of the view, above the skyline and do not interfere with the views of a scenic quality of the Blackwater River and surrounds. ➤ The turbines are seen above tracts of coniferous plantation forestry which are a large-scale human intervention in the landscape.
Residual Effect (incl. mitigating factors)	<p>Not Significant (EPA, 2022) An effect which causes noticeable changes in the character of the environment but without significant consequences.</p>

Viewpoint 2 – Dromore Viewpoint			
Viewpoint Description and Details	<ul style="list-style-type: none"> ➤ Description provided by 3rd Party Observer: <i>“This viewpoint is above the Dromore Quay at a crossroads over-looking the river. It represents views looking west from the eastern bank of the Blackwater river and residential and visiting receptors.”</i> ➤ View from a local road in the townland of Dromore. ➤ This viewpoint is also located at a Designated Scenic View in the Draft Waterford County Development Plan 2022-2028. ➤ Approximately 6.4 km east of the nearest turbine (T1). ➤ Grid Reference: Not provided by 3rd Party Observer, assumed to be the following based on desk study and site visits: E 609,633, N 590,692 ➤ No. of turbines visible: 11/17 		
LCA and Sensitivity	Provisional LCA 2 River Valleys and Lowlands – High	Visual Receptor(s) and Sensitivity	Motorists – Low Residents – Medium Scenic View – High
Description of ‘Baseline’	<p>This view is captured close to a designated scenic view in the Draft Waterford County Development Plan 2022-2028. The main focus of the designated view is to the north over the Blackwater valley, away from the Proposed Development. There are less-expansive, and shorter-ranging views in the direction of the Proposed Development. This direction is not the scenic focus of the view from this location.</p> <p>The foreground of the view is comprised of a gently downwards-sloping tilled agricultural field bordered by a hedgerow that can be seen running throughout the midground of the view. Beyond this the landscape consists of gently undulating rural farmland, with deciduous treelines and hedgerows defining the field pattern, and with farmsteads and one-off houses interspersed throughout the view. The landform rises in the background to form a ridgeline that limits any further views in this direction. These views are substantially shorter in terms of distance when compared to the views in the opposite direction (not shown in this image). A number of tracts of coniferous plantation forestry can be seen on the hills that make up this ridgeline.</p> <p>The character of the view in this direction is rural and is generally similar to other available views in this landscape.</p>		

Viewpoint 2 – Dromore Viewpoint	
Proposed Photomontage Description	Turbines from the eastern cluster are seen to the left-hand side of the background and turbines from the western cluster are seen to the right-hand side of the background and appear slightly smaller than the western cluster. All proposed turbines are seen above the skyline of the view, reducing the level of visual confusion introduced by the Proposed Development. The two clusters of turbines are visually separated in the view; however, all turbines are generally evenly spaced and the layouts are coherent and appropriate for this landscape type. There is some screening of the turbine towers of certain turbines by the topography and coniferous plantation forestry. In addition, six turbines are completely screened by the intervening topography.
Cumulative Effects	The existing Barranafaddock turbines, and the existing Woodhouse turbines are visible from this general location, however, it is noted that both of these existing wind farms are not within the horizontal extent of the views shown here. The existing Woodhouse turbines are located in the opposite direction to the proposed turbines, creating a combined (in succession – where an observer has to turn their head to see the various development.) view of turbines from this location. The existing Barranafaddock turbines are seen approximately 53 degrees clockwise (to the right-hand side of the rightmost proposed turbine in this view) from this viewpoint. This also creates a combined, in succession, view of turbines from this location. The Barranafaddock turbines are located approximately 20.5km from this viewpoint and appear as
Sensitivity of Visual Receptor(s)	Medium: While this view is located proximate to a designated scenic viewpoint in the Draft Waterford County Development Plan, the main focus of this view is to the north, where there are views of a far-higher scenic quality available. In addition, the view shown in this photomontage is not representative of views from the main viewing area for this designated view, where there will be additional screening provided by the mature hedgerows that line the side of the road directed towards the Proposed Development from this designated viewpoint.
Magnitude of Change	Slight: The proposals would be partially visible or visible at sufficient distance to be perceptible and result in a low level of change in the view and its composition and a low degree of contrast. The character of the view may be altered, but will remain similar to the baseline existing situation. This change could be short term or of a short duration. The Proposed Development is seen in the background of the view at as distance sufficient to result in a low level of change in terms of the scenic amenity attributable to this view. The turbines do not interfere with the views of the river Blackwater and are seen as relatively small background elements.
Significance of Effect	Medium x Slight = Minor = Slight (EPA, 2022) An effect which causes noticeable changes in the character of the environment without affecting its sensitivities
Mitigation Factors	➤ The main focus of this designated scenic view is to the north, away from the Proposed Development (south-west). There other turbines (Barranafaddock) located closer towards the main focus of the scenic

Viewpoint 2 – Dromore Viewpoint	
	<p>view over the river valley, with the turbines of the Proposed Development located further outside of the field of view in this direction.</p> <ul style="list-style-type: none"> ➤ Siting and design were developed in accordance with the guidelines for Hilly and Flat Farmland landscape character type. ➤ The distance of the viewpoint from the Proposed Development reduces the scale of the turbines, which appear as background elements within the view. ➤ Sparsely populated section of road and there are limited numbers of nearby residential properties. ➤ The turbines are viewed within the background of the view, above the skyline and do not interfere with the views of a scenic quality of the Blackwater River and surrounds (main views of which are in the other direction). ➤ The turbines are seen above tracts of coniferous plantation forestry which are a large-scale human intervention in the landscape.
Residual Effect (incl. mitigating factors)	<p>Not Significant (EPA, 2022) An effect which causes noticeable changes in the character of the environment but without significant consequences.</p>

Viewpoint 3 – Coolbagh, N. of Clashmore			
Viewpoint Description and Details	<ul style="list-style-type: none"> ➤ Description provided by 3rd Party Observer: <i>“This viewpoint is further south on the east bank of the Blackwater river looking north west and represents residential receptors in this elevated area.”</i> ➤ View from a local road in the townland of Coolbagh. ➤ Approximately 6.8 km east of the nearest turbine (T6). ➤ Grid Reference: Not provided by 3rd Party Observer, assumed to be the following based on desk study and site visits: E 611,162, N 586,277 ➤ No. of turbines visible: 16/17 		
LCA and Sensitivity	Provisional LCA 2 River Valleys and Lowlands – High	Visual Receptor(s) and Sensitivity	Motorists – Low Residents – Medium
Description of ‘Baseline’	<p>This view is captured from a small local road with a poor surface quality. The road slopes downwards towards the River Blackwater (which is not visible from this location) offering open views over a hedgerow of the opposing valley of the river. The foreground of the view consists of an agricultural pastureland field that is bordered by a mature hedgerow. Such fields commonly make up the majority of the landcover here, with the field pattern predominating throughout the view. In addition to these fields there are several farmsteads scattered throughout the midground and background, as well as a number of deciduous treelines, again bordering the agricultural fields. The landform rises in the background of the view forming a ridgeline that limit views to medium-distance views. Along the ridgeline a number of tracts of coniferous plantation forestry can be seen. The landscape is seen to be substantially modified by man in terms of the agricultural fields and the tracts of commercial forestry that define the view, as well as the electricity lines that introduce vertical elements into the view.</p>		

Viewpoint 3 – Coolbagh, N. of Clashmore	
	The character of the view is rural in nature, and this view is typical of views in this area.
Proposed Photomontage Description	Both the eastern and western cluster of turbines appear throughout the centre background of this view. Turbines from the western cluster appear slightly smaller than the eastern cluster, although this effect is minimal from this distance. All proposed turbines are seen above the skyline of the view, reducing the level of visual confusion introduced by the Proposed Development. The turbines are generally evenly spaced, aside from a number of overlapping turbines components from more-distant turbines in the western cluster, although in general and the layout is coherent and appropriate for this landscape type. There is some screening of the turbine towers of certain turbines by the topography and coniferous plantation forestry, particularly turbines of the western cluster (seen to the right-hand side of the line of turbines), where several turbines are almost completely screened. The turbines appear behind the ridgeline and so do not obstruct or interfere with any longer-ranging views.
Cumulative Effects	No other wind farms are visible, there are no cumulative visual effects.
Sensitivity of Visual Receptor(s)	Low: This viewpoint is located along what is a small local road with likely low traffic numbers. The most sensitive receptors are nearby residential receptors who are located over 6 km from the nearest turbine. The views from this location, representative of likely views of nearby residential receptors are, while rural in nature, not of a particularly high scenic quality in the first instance.
Magnitude of Change	<p>Slight: The proposals would be partially visible or visible at sufficient distance to be perceptible and result in a low level of change in the view and its composition and a low degree of contrast. The character of the view may be altered, but will remain similar to the baseline existing situation. This change could be short term or of a short duration.</p> <p>The Proposed Development is seen in the background of the view at a distance sufficient to result in a low level of change in terms of the scenic amenity attributable to this view. The turbines do not interfere with the views of the river Blackwater and are seen as relatively small background elements.</p>
Significance of Effect	Low x Slight = Minor/Negligible = Not Significant (EPA, 2022) An effect which causes noticeable changes in the character of the environment but without significant consequences.
Mitigation Factors	<ul style="list-style-type: none"> ➤ The distance of the viewpoint from the Proposed Development reduces the scale of the turbines, which appear as background elements within the view. ➤ Sparsely populated section of road and there are limited numbers of nearby residential properties. ➤ The turbines are viewed within the background of the view, above the skyline and do not interfere with the views of a scenic quality of the Blackwater River valley and surrounds. ➤ The turbines are seen above tracts of coniferous plantation forestry which are a large-scale human intervention in the landscape.

Viewpoint 3 – Coolbagh, N. of Clashmore	
Residual Effect (incl. mitigating factors)	Not Significant (EPA, 2022) An effect which causes noticeable changes in the character of the environment but without significant consequences.

Viewpoint 4 – Monang, S. of Knockanore			
Viewpoint Description and Details	<ul style="list-style-type: none"> ➤ Description provided by 3rd Party Observer: <i>“On the route of Waterford Scenic Route 4 and the Sean Kelly Heritage Cycle Route looking west towards the site just south of Knockanore. This viewpoint represents receptors using this scenic route and local residential receptors.”</i> ➤ View from a local road in the townland of Kilcockan. ➤ This view is captured from a small local road with a poor surface quality. ➤ There are a number of nearby residential receptors represented by this viewpoint, although it is noted that this viewpoint is located at point 1.3km south of the Kockanore National School and the Sacred Heart Church in Knockanore, where there no-to extremely limited views in the direction of the Proposed Development. ➤ Approximately 4 km east of the nearest turbine (T6). ➤ Grid Reference: Not provided by 3rd Party Observer, assumed to be the following based on desk study and site visits: E 608,109, N 587,853 ➤ No. of turbines visible: 12/17 		
LCA and Sensitivity	Prov. LCA 1 South-Western Upland Plateau - Moderate	Visual Receptor(s) and Sensitivity	Motorists – High Residents - Medium Cyclists - Medium
Description of ‘Baseline’	<p>An agricultural pastureland field can be seen in the foreground, bordered by a low hedgerow and wire fence. On the other side of this hedgerow sits a local road (that is screened from view by the hedgerow) that is bordered on the far side by a number of deciduous trees and a roadside hedgerow. An electricity line can be seen running through the midground of the view, introducing a vertical human element to the view. The midground of the view consists of gently rolling agricultural fields. Bordered by low hedgerows interspersed with deciduous trees. A number of residential dwellings and farmsteads can be seen interspersed throughout the view.</p> <p>In the right midground a tract of coniferous plantation forestry can be seen to screen views of the agricultural fields in this direction. Another larger tract of coniferous plantation forestry can be seen running from the right background to the centre-left background, which screens longer-distance views in this direction. There are longer-distance views available in the left background, where more agricultural fields and commercial forestry can be seen, with the landform rising gently to form a ridgeline. Again, the skyline in this part of the view is defined by coniferous plantation forestry. The character of the view is rural in nature, and this view is typical of views in this area.</p>		

Viewpoint 4 – Monang, S. of Knockanore	
Proposed Photomontage Description	There are nine turbines visible from mid-tower up, with 10 turbine hubs fully visible. The blades of two additional turbines can also be seen above the skyline of the view. The remaining five turbines are completely screened from view. From this distance the turbines occupy a medium vertical extent in the view. All proposed turbines are seen above the skyline of the view, reducing the level of visual confusion introduced by the Proposed Development. There are a number of overlapping turbine components from this orientation, although this will always occur from certain locations and the effect will differ depending on the exact location of the viewer. All turbines are viewed within the same viewing direction as the commercial forestry seen along the ridgeline in this view. This reduces the level of interference that the proposed turbines cause within the higher-quality part of this view.
Cumulative Effects	No other wind farms are visible, there are no cumulative visual effects.
Sensitivity of Visual Receptor(s)	<p>Medium: The change in the view may involve partial obstruction of existing view or partial change in character and composition of the baseline through the introduction of new elements or removal of existing elements. Likely to occur at locations where the development is partially visible over a moderate or medium extent, and which are not in close proximity to the development. Change may be readily noticeable but not substantially different in scale and character from the surroundings and wider setting.</p> <p>Motorists travelling along this route are likely low in numbers considering the quality of the roadway. There are a number of residential receptors located near this viewpoint, with none actually located at this viewpoint. Cyclists along the Sean Kelly Heritage Cycle Route will be acting in a recreational capacity and are the primary reason for this viewpoint being assigned a sensitivity of Medium.</p>
Magnitude of Change	Moderate: The turbines occupy a medium vertical and horizontal extent within this view however their addition to the view results in a low level of change in terms of the scenic amenity attributable to this view, given that they do not obstruct or interfere with the medium-distance views over the rural farmland. In addition, the turbines, while changing the character of the view, are seen as background elements within the view.
Significance of Effect	Medium x Moderate = Moderate/Minor = Moderate (EPA, 2022) An effect, which by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
Mitigation Factors	<ul style="list-style-type: none"> ➤ This viewpoint is located at point 1.3km south of the Kockanore National School and the Sacred Heart Church in Knockanore, where there no-to extremely limited views in the direction of the Proposed Development. ➤ Siting and design were developed in accordance with the guidelines for Hilly and Flat Farmland landscape character type. ➤ The distance of the viewpoint from the Proposed Development reduces the scale of the turbines, which appear as background elements within the view. ➤ Sparsely populated section of road and there are relatively limited numbers of nearby residential properties.

Viewpoint 4 – Monang, S. of Knockanore	
	<ul style="list-style-type: none"> ➤ The turbines are viewed within the background of the view, above the skyline and do not interfere with the views of the rural farmland. ➤ The turbines are seen above tracts of coniferous plantation forestry which are a large-scale human intervention in the landscape.
Residual Effect (incl. mitigating factors)	Slight (EPA, 2022) An effect which causes noticeable changes in the character of the environment without affecting its sensitivities

Viewpoint 5 – W. of Knockanore over Killeenagh South			
Viewpoint Description and Details	<ul style="list-style-type: none"> ➤ Description provided by 3rd Party Observer: <i>“This viewpoint provides a mid-range view from just west of Knockanore looking across the settlement of Killeenagh South. It represents the impact for residential receptors and road users of a popular local road.”</i> ➤ This view is captured from within a privately owned agricultural field with no public access in the townland of Killeenagh South. This field is located adjacent to a local road where similar views are available. This local road is small and has no road markings. ➤ This view shows a more open and expansive view than is available for the residents of Knocknamore village itself. Viewpoint 3 from the original EIAR is a more representative view for these residential receptors as it is located immediately adjacent to these receptors. It is also noted that this view is not representative of the view from the cluster of residential receptors directly west of the viewpoint, 300m along the road (the houses which can be seen in the Photomontage) as the topography substantially limits available views in the direction of the Proposed Development from this location. This view is therefore representative of the views of a single resident located to the north of this viewpoint, on the other side of the local road. ➤ Approximately 3.4 km east of the nearest turbine (T1). ➤ Grid Reference: Not provided by 3rd Party Observer, assumed to be the following based on desk study and site visits: E 607,012, N 589,176 ➤ No. of turbines visible: 11/17 		
LCA and Sensitivity	Prov. LCA 1 South-Western Upland Plateau - Moderate	Visual Receptor(s) and Sensitivity	Motorists – Low Residents (Single) - Low
Description of ‘Baseline’	<p>The foreground of this view is comprised of an agricultural field border in the right foreground to the centre-left foreground by a low hedgerow, on the other side of which is a local road. Electricity lines can be seen running alongside this road, as well as throughout the midground of the view. The land cover of the midground is comprised of agricultural fields defined by deciduous treelines and hedgerows. There are a number of residential dwellings located along the local road in the centre and right midground. The landform is gently undulating, sloping downwards in the foreground and rising in the midground, allowing for long-range views from this viewpoint, until the rising topography in the background forms a ridgeline that contains any longer-ranging views. The background of the view primarily consists of commercial plantation forestry comprised of coniferous monoculture trees, which can be seen across the entire skyline of the view.</p>		

Viewpoint 5 – W. of Knockanore over Killeenagh South	
	The character of the view is rural in nature, and this view is typical of views in this area.
Proposed Photomontage Description	Five turbine hubs and the blades of an additional six turbines can be seen in the background of this view, above and behind the ridgeline that forms the skyline of the view. There is only one turbine where a substantial section of the turbine tower can be seen. The remaining six turbines are completely screened from view. All proposed turbines are seen above the skyline of the view, reducing the level of visual confusion introduced by the Proposed Development. In addition, the turbines appear evenly spaced, with minimal overlap of turbine components. All turbines are viewed within the same viewing direction as the commercial forestry seen along the ridgeline in this view. This reduces the level of interference that the proposed turbines cause within the higher-quality part of this view, although it is noted there are no highly scenic parts to this view given the level of existing human interference in the landscape.
Cumulative Effects	No other wind farms are visible, there are no cumulative visual effects.
Sensitivity of Visual Receptor(s)	Low – This viewpoint represents a single residential dwelling (to the north) and transport receptors travelling along this unmarked local road. Motorists travelling along this route are likely relatively low in numbers considering the size of the road of the roadway.
Magnitude of Change	Slight: The proposals would be partially visible or visible at sufficient distance to be perceptible and result in a low level of change in the view and its composition and a low degree of contrast. The character of the view may be altered, but will remain similar to the baseline existing situation. This change could be short term or of a short duration.
Significance of Effect	Low x Slight = Minor/Negligible = Not Significant (EPA, 2022) An effect which causes noticeable changes in the character of the environment but without significant consequences.
Mitigation Factors	<ul style="list-style-type: none"> ➤ Siting and design were developed in accordance with the guidelines for Hilly and Flat Farmland landscape character type. ➤ The distance of the viewpoint from the Proposed Development reduces the scale of the turbines, which appear as background elements within the view. ➤ Sparsely populated section of road and there are limited numbers of nearby residential properties. In fact, as outlined above this viewpoint represent the views of just one residential receptor. ➤ The turbines are viewed within the background of the view, above the skyline and do not interfere with the midground views of the rural countryside. ➤ The turbines are seen above tracts of coniferous plantation forestry which are a large-scale human intervention in the landscape. ➤ The majority of the turbine components are screened by the topography and forestry, with only the blades of the majority of the visible turbines (6/11) seen above the ridgeline.
Residual Effect (incl. mitigating factors)	Not Significant (EPA, 2022) An effect which causes noticeable changes in the character of the environment but without significant consequences.

Viewpoint 6 – Propage			
Viewpoint Description and Details	<ul style="list-style-type: none"> ➤ Description provided by 3rd Party Observer: <i>“This view is taken from just south of Brown’s Cross Roads from the road which runs along the eastern boundary of the Eastern Cluster site. It represents residential receptors in this area in close proximity to the proposed development.”</i> ➤ View from a local road in the townland of Propoge. This Viewpoint is located proximate to two residential dwellings, with a number of dwellings located further north and south along the local road with likely similar views. ➤ Approximately 1.2 km south-east of the nearest turbine (T6). ➤ Grid Reference: Not provided by 3rd Party Observer, assumed to be the following based on desk study and site visits: E 605,437, N 585,962 ➤ No. of turbines visible: This is unclear given the limited horizontal extent of the Photomontage shown, however, within the 39.6 degree image there are 5 turbines visible. 		
LCA and Sensitivity	Prov. LCA 1 South-Western Upland Plateau - Moderate	Visual Receptor(s) and Sensitivity	Motorists – Low Residents - High
Description of ‘Baseline’	<p>The foreground of the view is comprised of an agricultural field that slopes downwards towards a low hedgerow with a number of deciduous trees and shrubs interspersed along its path. An electricity line can be seen running parallel with this ditch. Another agricultural field can be seen on the other side of this hedgerow, throughout the midground, which is backed by an area of commercial plantation forestry. This forestry is bordered by a line of native deciduous trees providing some visual softening of the commercial forestry monoculture. This forestry is seen throughout the midground. In the background of the view the landform can be seen to slope upwards towards a ridgeline forming the skyline of the view, with the highest point along this ridgeline forming a small hill in the left background. The landcover here is a mixture of agricultural fields and the associated farmsteads, as well as some deciduous treelines. Further up the hill the land is covered by coniferous monoculture forestry, demonstrating a substantial level of human interference in the landscape. This forestry is seen throughout the background and covers the vast majority of the ridgeline that forms the skyline.</p>		
Proposed Photomontage Description	<p>The Photomontage shows a view of five turbines visible from this location, although there are likely more visible outside of the right-hand horizontal extent of the view shown here. It is again noted that the leftmost turbines seen is positioned too far to the left, and is actually supposed to be positioned on the right side of the small hill seen in the left background. In any case, there are a number of turbines fully visible within this view, that take up a moderate vertical extent within the view. There is some screening provided by the commercial forestry of the lower sections of the turbine towers, but the majority of the closest turbines will be visible. The turbines are seen as set-back from this location due to the distances involved (approx. 1.2 km for the closest turbine) and are seen above the skyline of the view, reducing the level of visual confusion introduced by the Proposed Development. In addition, the turbines appear evenly spaced, with minimal overlap of turbine components. All turbines are viewed within the same viewing direction as the commercial forestry seen along the ridgeline in this</p>		

Viewpoint 6 – Propage	
	view. This reduces the level of interference that the proposed turbines cause within the higher-quality part of this view.
Cumulative Effects	No other wind farms are visible, there are no cumulative visual effects.
Sensitivity of Visual Receptor(s)	Medium - This viewpoint is located along a small local road with likely low levels of traffic. There are two residential dwellings located nearby with their primary views in the direction of the Proposed Development. These views are already subject to high levels of human interference in the landscape (commercial forestry) and cannot be said to be of a particularly high scenic quality.
Magnitude of Change	<p>Moderate: The change in the view may involve partial obstruction of existing view or partial change in character and composition of the baseline through the introduction of new elements or removal of existing elements. Likely to occur at locations where the development is partially visible over a moderate or medium extent, and which are not in close proximity to the development. Change may be readily noticeable but not substantially different in scale and character from the surroundings and wider setting.</p> <p>The turbines occupy a medium vertical and horizontal extent within this view, however, their addition to the view results in a low level of change in terms of the scenic amenity attributable to this view, given that they do not obstruct or interfere with the medium-distance views over the rural farmland. In addition, the turbines, while changing the character of the view, are seen as background elements within the view.</p>
Significance of Effect	<p>Medium x Moderate = Moderate/Minor = Moderate (EPA, 2022) An effect, which by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.</p>
Mitigation Factors	<ul style="list-style-type: none"> ➤ The distance of the viewpoint from the Proposed Development reduces the scale of the turbines, which appear as background elements occupying a moderate vertical extent within the view. ➤ Sparsely populated section of road and there are relatively limited numbers of nearby residential properties. ➤ The turbines are seen as set-back from this location due to the distances involved (approx. 1.2 km for the closest turbine) and are seen above the skyline of the view, reducing the level of visual confusion introduced by the Proposed Development. ➤ The turbines are viewed within the background of the view, above the skyline and do not interfere with the views of the rural farmland. ➤ The turbines are seen above tracts of coniferous plantation forestry which are a large-scale human intervention in the landscape.
Residual Effect (incl. mitigating factors)	<p>Slight (EPA, 2022) An effect which causes noticeable changes in the character of the environment without affecting its sensitivities</p>

Viewpoint 7 – Ballydaniel			
Viewpoint Description and Details	<ul style="list-style-type: none"> ➤ Description provided by 3rd Party Observer: <i>“This is a small rural settlement of four residential properties directly to the south of the Eastern Cluster. The view is from a small rural connecting road and represents the visual impact on a group of residential receptors and road users.”</i> ➤ View from a local road in the townland of Ballydaniel. ➤ This view is captured from a small local road of poor road quality. There are several residential receptors with these views nearby. The views to the east, away from the Proposed Development are long-ranging and expansive, whereas views towards the site are short-range views towards commercial forestry monoculture. ➤ Approximately 950m south-east from the nearest turbine (T10). ➤ Grid Reference: Not provided by 3rd Party Observer, assumed to be the following based on desk study and site visits: E 604,091, N 584,396 ➤ No. of turbines visible: 5/17 		
LCA and Sensitivity	LCT 10b Fissured Fertile Middleground (Rylane east to Waterford) - Low	Visual Receptor(s) and Sensitivity	Motorists – Low Residents - High
Description of ‘Baseline’	<p>The foreground of this view is of an agricultural field which takes up the majority of the foreground and midground. A wire fence which borders the local road can be seen in close proximity to the viewpoint. The agricultural field as border by a low hedgerow with several deciduous trees and shrubs interspersed along it. A number of similar fields can be seen behind the closest one, with a gentle slope upwards towards the left-hand side of the image. Views are restricted to relatively short-distance by the commercial plantation forestry that can be seen throughout the background of this view. The monoculture forestry obstructs and longer-ranging views in this direction. A line of deciduous native trees can be seen in from of the commercial forestry providing some visual softening of the views of the forestry.</p>		
Proposed Photomontage Description	<p>There are five turbine hubs visible within this Photomontage, with the turbine towers of three of these turbines also visible. The remainder of the turbine components and other turbines in the Proposed Development are screened by the intervening topography or the commercial forestry. The closest turbine (T10) is located just under 1 km from the viewpoint and, along with turbine T9 (the second closest turbine) occupies a relatively large vertical extent within the view. The proposed turbines are viewed behind an initial tract of commercial forestry and on the other side of a high point in elevation, providing a degree of separation from the viewpoint and the turbines.</p>		
Cumulative Effects	No other wind farms are visible, there are no cumulative visual effects.		
Sensitivity of Visual Receptor(s)	<p>Medium – The viewpoint is mainly representative of the views from several residential receptors located approx. 1km from the nearest turbine. While residential receptors are generally sensitive receptors, the direction of the turbines in relation to these dwellings means that it will be the gable end of these properties that will face towards the proposed turbines limiting available views of the Proposed Development from these dwellings. In any</p>		

Viewpoint 7 – Ballydaniel	
	case, the views of primary scenic amenity from these dwellings are directed away from the Proposed Development, to the east, where the topography slopes downwards allowing long-range views over the countryside.
Magnitude of Change	<p>Substantial: Substantial change, where the proposals would result in large-scale, prominent or very prominent change, leading to substantial obstruction of existing view or complete change in character and composition of the baseline though removal of key elements or addition of uncharacteristic elements which may or may not be visually discordant. This includes viewpoints where the proposed development is fully or almost fully visible over a wide extent, at close proximity to the viewer. This change could be long term or of a long duration.</p> <p>The turbines (particularly those closest to the viewpoint) appear to occupy a large vertical extent within the view. The turbines do change the character of the view in this direction, although it is noted that the baseline character of the view is one of commercial forestry operations.</p>
Significance of Effect	<p>Medium x Substantial = Moderate = Significant (EPA, 2022) An effect, which by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.</p>
Mitigation Factors	<ul style="list-style-type: none"> ➤ The turbines occupy a limited horizontal extent within the view. ➤ There are views of a much higher scenic quality available to the east, away from the Proposed Development. Whereas existing views towards the Proposed Development site are short-range views of commercial forestry. ➤ Sparsely populated section of road and there are relatively limited numbers of nearby residential properties. ➤ The turbines are seen above the skyline of the view, reducing the level of visual confusion introduced by the Proposed Development. ➤ The turbines are seen above tracts of coniferous plantation forestry which are a large-scale human intervention in the landscape.
Residual Effect (incl. mitigating factors)	<p>Moderate (EPA, 2022) An effect that alters the character of the environment in a manner consistent with existing and emerging baseline trends.</p>

Viewpoint 8 – Lyrenacrriga / Property on the R634	
Viewpoint Description and Details	<ul style="list-style-type: none"> ➤ Description provided by 3rd Party Observer: <i>“This viewpoint is taken from a property on the R634 (Scenic section) at very close proximity to the development. It represents the visual impact that will be experienced by the residents and properties in the vicinity. It also represents views for road users on this scenic section of the R634.”</i> ➤ View from the R634 regional road in the townland of Ballynatray Commons. This viewpoint is also located along a Co. Cork designated scenic route. ➤ Approximately 780m west from the nearest turbine (T11). ➤ Grid Reference: Not provided by 3rd Party Observer, assumed to be the following based on desk study and site visits: E 602,708, N 586,246

Viewpoint 8 – Lyrenacrriga / Property on the R634			
	<p>➤ No. of turbines visible: This is unclear given the limited horizontal extent of the Photomontage shown, however, within the 39.6 degree image there are 4 turbines visible.</p>		
LCA and Sensitivity	LCT 10b Fissured Fertile Middleground (Rylane east to Waterford) - Low	Visual Receptor(s) and Sensitivity	Motorists – Medium Residents – High Scenic Route - High
Description of 'Baseline'	<p>The foreground of the view is comprised of a grass-covered residential garden, bordered by a dense, low hedgerow. The corner of a single-story residential dwelling can be seen in the left side of the image. The residential dwelling and garden can be seen to be bordered by a larger agricultural field to the east (behind the house) and south (to the right-hand side of the image). It is noted that outside of the view to the left-hand side, a tract of coniferous plantation forestry borders the garden. An electricity line can be seen running throughout the midground, introducing man-made vertical elements into the view. The background of the view consists of a large tract of coniferous plantation forestry which screens longer-range views and restricts visibility to short-range views. The character of the view is rural, although the view is towards a substantial level of human interference in the landscape (i.e. towards the commercial monoculture forestry) and despite the scenic route designation there is no high level of scenic quality to the view.</p>		
Proposed Photomontage Description	<p>There are four turbine hubs and towers visible within this Photomontage. The closest turbine (T11) is located approximately 780m from the viewpoint and, along with the other turbines visible here, occupies a relatively large vertical extent within the view. The proposed turbines are viewed behind an initial tract of commercial forestry, providing a degree of separation from the viewpoint and the turbines.</p>		
Cumulative Effects	<p>No other wind farms are visible, there are no cumulative visual effects.</p>		
Sensitivity of Visual Receptor(s)	<p>High – This viewpoint represents a number of residential receptors located in close proximity to the Proposed Development, although it is noted that the primary views of these residents are not directed towards the Proposed Development, given the more expansive views available to the west. The existing views towards the Proposed Development site are of low scenic value. In relation to the overalls scenic route where this viewpoint is located, this section has a relatively low level of scenic quality in terms of views.</p>		
Magnitude of Change	<p>Moderate: The change in the view may involve partial obstruction of existing view or partial change in character and composition of the baseline through the introduction of new elements or removal of existing elements. Likely to occur at locations where the development is partially visible over a moderate or medium extent, and which are not in close proximity to the development. Change may be readily noticeable but not substantially different in scale and character from the surroundings and wider setting.</p> <p>The views of turbines are limited to a moderate horizontal extent, and there is likely screening of the majority of the eastern cluster (the cluster in view in this Photomontage) of the Proposed Development by the commercial forestry. There are no fundamental highly sensitive landscape features</p>		

Viewpoint 8 – Lyrenacrriga / Property on the R634	
	altered as a result of the addition of the Proposed Development into the view.
Significance of Effect	High x Moderate = Moderate = Significant (EPA, 2022) An effect, which by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
Mitigation Factors	<ul style="list-style-type: none"> ➤ The turbines occupy a limited horizontal extent within the view, with a large number of the turbines within this cluster (eastern cluster) likely screened from view from this location. ➤ There are views of a higher scenic quality available to the west, away from the eastern cluster of the Proposed Development. Whereas existing views towards the Proposed Development site are short-range views of commercial monoculture forestry. ➤ Sparsely populated section of road and there are relatively limited numbers of nearby residential properties. ➤ The turbines are seen above the skyline of the view, reducing the level of visual confusion introduced by the Proposed Development. ➤ The turbines are seen above tracts of coniferous plantation forestry which are a large-scale human intervention in the landscape. ➤ In relation to the overalls scenic route where this viewpoint is located, this section has a relatively low level of scenic quality in terms of views. ➤ The turbines are evenly spaced with limited overlap of turbine components in the view.
Residual Effect (incl. mitigating factors)	Moderate (EPA, 2022) An effect that alters the character of the environment in a manner consistent with existing and emerging baseline trends

Viewpoint 9a – R634 / Views East and West			
Viewpoint Description and Details	<ul style="list-style-type: none"> ➤ Description provided by 3rd Party Observer: <i>“This viewpoint is on the R634 (Scenic Section) on the county boundary between Waterford and Cork between the two clusters of proposed turbines. It is a back to back view looking East (a) and West (b). It represents views for road users and residents living in the vicinity.”</i> ➤ View from the R634 regional road in the townland of Breeda. This viewpoint is also located along a Co. Cork designated scenic route. ➤ There are no residential receptors located at or near this viewpoint, with the nearest residential dwelling located greater than 500m away. This viewpoint is not an accurate representation of a view experienced by the closest residential receptor. ➤ Approximately 630m west of the nearest turbine (T5). ➤ Grid Reference: Not provided by 3rd Party Observer, assumed to be the following based on desk study and site visits: E 602,557, N 587,082 ➤ No. of turbines visible: This is unclear given the limited horizontal extent of the Photomontage shown, however, within the 39.6 degree image there are 4 turbines visible. 		
LCA and Sensitivity	LCT 10b Fissured Fertile Middleground	Visual Receptor(s) and Sensitivity	Motorists – Medium Scenic Route - High

Viewpoint 9a – R634 / Views East and West	
	(Rylane east to Waterford) - Low
Description of 'Baseline'	The foreground of the view consists of a view of the regional road, which is bordered by a low hedgerow. A gap in the hedgerow leading to an agricultural grassland field is seen in the left midground. This field is seen above the hedgerow throughout the view. The topography can be seen to slope gently upwards to the left-hand side of the image forming a small ridgeline, partially obscuring views of the coniferous forestry in the left background of the view. The entirety of the background view is taken up by commercial monoculture forestry which screens any longer-range views in this direction. The view is of a rural character and is unremarkable in nature.
Proposed Photomontage Description	One turbine is seen in almost its full extent in the right background of the image, above the line of commercial forestry. The hubs of two other turbines and the blades of an addition turbine are visible further form the viewpoint in this image. The closest turbine (T11) is located approximately 780m from the viewpoint and, along with the other turbines visible here, occupies a relatively large vertical extent within the view. The proposed turbines are viewed behind an initial tract of commercial forestry, providing a degree of separation from the viewpoint and the turbines.
Cumulative Effects	No other wind farms are visible, there are no cumulative visual effects.
Sensitivity of Visual Receptor(s)	Medium – As stated previously this view does not represent the view of any residential receptors and is likely only representative of motorists travelling along the regional road. While this is a designated scenic route there is limited scenic amenity attributable to this part of the view, considering it is a short-range view over a field towards commercial forestry.
Magnitude of Change	Moderate: The change in the view may involve partial obstruction of existing view or partial change in character and composition of the baseline through the introduction of new elements or removal of existing elements. Likely to occur at locations where the development is partially visible over a moderate or medium extent, and which are not in close proximity to the development. Change may be readily noticeable but not substantially different in scale and character from the surroundings and wider setting. The views of turbines are limited to a moderate horizontal extent, and there is likely screening of the majority of the eastern cluster (the cluster in view in this Photomontage) of the Proposed Development by the commercial forestry. There are no fundamental highly sensitive landscape features altered as a result of the addition of the Proposed Development into the view.
Significance of Effect	Medium x Moderate = Moderate/Minor = Moderate (EPA, 2022) An effect that alters the character of the environment in a manner consistent with existing and emerging baseline trends
Mitigation Factors	➤ The turbines occupy a limited horizontal extent within the view, with a large number of the turbines within this cluster (eastern cluster) likely screened from view from this location.

Viewpoint 9a – R634 / Views East and West	
	<ul style="list-style-type: none"> ➤ There are views of a higher scenic quality available to the west, away from the eastern cluster of the Proposed Development. Whereas existing views towards the Proposed Development site are short-range views of commercial monoculture forestry. ➤ Sparsely populated section of road and there are no residential properties represented by this viewpoint. ➤ The turbines are seen above the skyline of the view, reducing the level of visual confusion introduced by the Proposed Development. ➤ The turbines are seen above tracts of coniferous plantation forestry which are a large-scale human intervention in the landscape. ➤ In relation to the overalls scenic route where this viewpoint is located, this section has a relatively low level of scenic quality in terms of views. ➤ The turbines are evenly spaced with limited overlap of turbine components in the view. ➤ Siting and design were developed in accordance with the guidelines for Hilly and Flat Farmland landscape character type.
Residual Effect (incl. mitigating factors)	<p>Slight (EPA, 2022) An effect which causes noticeable changes in the character of the environment without affecting its sensitivities</p>

Viewpoint 9b – R634 / Views East and West			
Viewpoint Description and Details	<ul style="list-style-type: none"> ➤ Description provided by 3rd Party Observer: <i>“This viewpoint is on the R634 (Scenic Section) on the county boundary between Waterford and Cork between the two clusters of proposed turbines. It is a back to back view looking East (a) and West (b). It represents views for road users and residents living in the vicinity.”</i> ➤ View from the R634 regional road in the townland of Breeda. This viewpoint is also located along a Co. Cork designated scenic route. ➤ There are no residential receptors located at or near this viewpoint, with the nearest residential dwelling located greater than 500m away. This viewpoint is not an accurate representation of a view experienced by the closest residential receptor. ➤ Approximately 630m west of the nearest turbine (T5). ➤ Grid Reference: Not provided by 3rd Party Observer, assumed to be the following based on desk study and site visits: E 602,557, N 587,082 ➤ No. of turbines visible: 6/17 		
LCA and Sensitivity	LCT 10b Fissured Fertile Middleground (Rylane east to Waterford) - Low	Visual Receptor(s) and Sensitivity	Motorists – Medium Scenic Route - High
Description of ‘Baseline’	<p>The foreground of the image shows a view over a low hedgerow of a grassy agricultural field. This field can be seen, along with several others to be laid out in a well-structured pattern. The borders of these fields are defined by mature hedgerows interspersed with deciduous trees. The topography slopes gently downwards away from the viewpoint to a large tract of coniferous plantation forestry. This forestry is seen to screen longer-range visibility in the right and centre background of side of the view. In the left background the topography permits longer range views over the</p>		

Viewpoint 9b – R634 / Views East and West	
	commercial forestry. Within the longer-range view a landscape typical to the area can be seen, with farm buildings, deciduous trees and commercial monoculture forestry interspersed throughout this part of the view.
Proposed Photomontage Description	There are six turbines visible, seen above the commercial forestry in the background of the view. The turbines appear relatively evenly spaced with no overlap of turbine components apparent. The turbines occupy a medium horizontal and vertical extent within the view. The proposed met mast is similarly visible in the left background. The well-ordered layout of the turbines from this perspective aligns with the well-ordered field pattern seen in the preceding space, creating visual congruency between the Proposed Development and the landscape. The turbines are well absorbed within the landscape considering their scale within the view available.
Cumulative Effects	No other wind farms are visible, there are no cumulative visual effects.
Sensitivity of Visual Receptor(s)	Medium – As stated previously this view does not represent the view of any residential receptors and is likely only representative of motorists travelling along the regional road. While this is a designated scenic route there is limited scenic amenity attributable to this part of the view, considering it is a short-range view over a field towards commercial forestry.
Magnitude of Change	<p>Slight: The proposals would be partially visible or visible at sufficient distance to be perceptible and result in a low level of change in the view and its composition and a low degree of contrast. The character of the view may be altered, but will remain similar to the baseline existing situation. This change could be short term or of a short duration.</p> <p>The views of turbines are limited to a moderate horizontal and vertical extent, and there are no fundamental highly sensitive landscape features altered as a result of the addition of the Proposed Development into the view. The addition of the turbines to the view results in a low level of change in terms of the scenic amenity attributable to this view, given that they are primarily seen above the commercial forestry and cause minimal interference with the medium and long-distance views over the rural farmland. In addition, the turbines, while changing the character of the view, are seen as background elements within the view.</p>
Significance of Effect	Medium x Slight = Minor = Slight (EPA, 2022) An effect which causes noticeable changes in the character of the environment without affecting its sensitivities
Mitigation Factors	<ul style="list-style-type: none"> ➤ Siting and design were developed in accordance with the guidelines for Hilly and Flat Farmland landscape character type. ➤ The well-ordered layout of the turbines from this perspective aligns with the well-ordered field pattern seen in the preceding space, creating visual congruency between the Proposed Development and the landscape. ➤ Existing views towards the Proposed Development site are medium-range views of commercial monoculture forestry. ➤ Sparsely populated section of road and there are no residential properties represented by this viewpoint. ➤ The turbines are seen primarily above the skyline of the view, reducing the level of visual confusion introduced by the Proposed Development.

Viewpoint 9b – R634 / Views East and West	
	<ul style="list-style-type: none"> ➤ The turbines are seen above tracts of coniferous plantation forestry which are a large-scale human intervention in the landscape. ➤ In relation to the overalls scenic route where this viewpoint is located, this section has a relatively low level of scenic quality in terms of views. ➤ The turbines are evenly spaced with limited overlap of turbine components in the view.
Residual Effect (incl. mitigating factors)	<p>Not Significant (EPA, 2022) An effect which causes noticeable changes in the character of the environment but without significant consequences.</p>

Viewpoint 10 – Glennaglough			
Viewpoint Description and Details	<ul style="list-style-type: none"> ➤ Description provided by 3rd Party Observer: <i>“Glennaghlough is a dispersed settlement on a minor road which runs between the two proposed development clusters. The view is looking west towards the Western Cluster. It represents the elevated impact that will be experienced by residential receptors in this area.”</i> ➤ View from a local road in the townland of Glennaglough. ➤ Approximately 1 km east of the nearest turbine (T17). ➤ Grid Reference: Not provided by 3rd Party Observer, assumed to be the following based on desk study and site visits: E 601,257, N 587,215 ➤ No. of turbines visible: This is unclear given the limited horizontal extent of the Photomontage shown, however, within the 39.6 degree image there are 5 turbines visible. 		
LCA and Sensitivity	Prov. LCA 1 South-Western Upland Plateau - Moderate	Visual Receptor(s) and Sensitivity	Motorists – Low Residents - High
Description of ‘Baseline’	<p>The foreground of the image is comprised on agricultural grassland field bordered by a wire fence and mature hedgerow. The topography slopes downwards forming a small valley, on the opposite side of which a number of other agricultural fields can be seen, defined by mature hedgerows interspersed with deciduous trees, seen in the midground. A single residential dwelling can be seen in the left midground, surrounded by mature deciduous trees. The topography rises in the background forming a ridgeline that provides visual containment to the view. A large tract of mature coniferous plantation forestry can be seen upon the ridgeline in the centre background, with some younger commercial forestry seen in the left and right background. The character of the view is rural although there is evidence of large-scale human interference in the landscape (i.e. the large tracts of commercial forestry).</p>		
Proposed Photomontage Description	<p>Five turbines can be seen almost in their entirety upon the ridgeline in the background of the view. The turbines are seen to occupy a large vertical and medium horizontal extent within the view from this location. The turbines are viewed in two smaller clusters within this view, with two seen in the left background and three more seen in the right background. The turbines in general are well spaced and there is minimal overlap of turbine</p>		

Viewpoint 10 – Glennaglough	
	components within the view. The turbines appear to have a degree of separation from this viewpoint and appear on the other side of the valley.
Cumulative Effects	No other wind farms are visible, there are no cumulative visual effects.
Sensitivity of Visual Receptor(s)	High – There are several residential receptors located along this road with a similar potential view as the one seen in this photomontage. However, it is noted that the current baseline view across the valley, while rural in nature is not considered particularly scenic, with limited special aesthetic characteristics. Road users are likely limited to local residents given the size of the road and the presence of the adjacent regional road to the east.
Magnitude of Change	<p>Moderate: The change in the view may involve partial obstruction of existing view or partial change in character and composition of the baseline through the introduction of new elements or removal of existing elements. Likely to occur at locations where the development is partially visible over a moderate or medium extent, and which are not in close proximity to the development. Change may be readily noticeable but not substantially different in scale and character from the surroundings and wider setting.</p> <p>The views of turbines are limited to a moderate horizontal extent, while occupying a large vertical extent. There are no fundamental highly sensitive landscape features altered as a result of the addition of the Proposed Development into the view.</p>
Significance of Effect	<p>High x Moderate = Moderate = Significant (EPA, 2022) An effect, which by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.</p>
Mitigation Factors	<ul style="list-style-type: none"> ➤ The well-ordered layout of the turbines corresponds with the field pattern seen in the preceding space, creating visual congruency between the Proposed Development and the landscape. ➤ Existing views towards the Proposed Development site are medium-range views of commercial monoculture forestry. ➤ Sparsely populated section of road with limited numbers of residential receptors. ➤ The turbines are seen primarily above the skyline of the view, reducing the level of visual confusion introduced by the Proposed Development. ➤ The turbines are seen above tracts of coniferous plantation forestry which are a large-scale human intervention in the landscape. ➤ The turbines are evenly spaced with limited overlap of turbine components in the view.
Residual Effect (incl. mitigating factors)	<p>Moderate (EPA, 2022) An effect that alters the character of the environment in a manner consistent with existing and emerging baseline trends</p>

Viewpoint 11 – Sandyhill / Local Property	
Viewpoint Description and Details	<ul style="list-style-type: none"> ➤ Description provided by 3rd Party Observer: <i>“This viewpoint is from the minor road running to the west of the Western Cluster looking</i>

Viewpoint 11 – Sandyhill / Local Property			
	<p><i>west. It represents local residents living in very close proximity to the nearest turbines.”</i></p> <ul style="list-style-type: none"> ➤ View from a local road in the townland of Sandyhill. ➤ Approximately 740m west of the nearest turbine (T16). ➤ It is noted that there are more expansive views over the rolling countryside available to the south-west from this location, away from the Proposed Development. ➤ Grid Reference: Not provided by 3rd Party Observer, assumed to be the following based on desk study and site visits: E 598,978, N 586,903 ➤ No. of turbines visible: This is unclear given the limited horizontal extent of the Photomontage shown, however, within the 39.6 degree image there are 2 turbines visible. 		
LCA and Sensitivity	LCT 10b Fissured Fertile Middleground (Rylane east to Waterford) - Low	Visual Receptor(s) and Sensitivity	Motorists – Low Residents - High
Description of ‘Baseline’	The foreground of the view is comprised of an agricultural grassland field, with a wire fence and hedgerow seen in the left foreground. The agricultural field continues into the midground with limited screening elements until the far edge of the field, which is bordered by a line of tall, mature deciduous trees, which substantially screen any longer-range views in this direction. A farm shed and residential dwelling can be seen in the left background. The residential dwelling is somewhat screened from view by a mature hedgerow that borders the property.		
Proposed Photomontage Description	One turbine hub is partially visible above the treeline in the centre background of the view. Half the blade of an additional turbine is also visible above the treeline in the left background. The turbines occupy a large vertical extent within the view but are substantially screened from view by the intervening mature treeline, which in summer months will provide increased levels of screening than what is seen in this image.		
Cumulative Effects	No other wind farms are visible, there are no cumulative visual effects.		
Sensitivity of Visual Receptor(s)	High – There are several residential receptors located along this road with a similar potential view as the one seen in this photomontage. However, it is noted that the current baseline view over an agricultural field, while rural in nature is not considered particularly scenic, with limited notable aesthetic characteristics. Road users are likely limited to local residents given the size of the road and the presence of the adjacent regional road to the east.		
Magnitude of Change	<p>Slight: The proposals would be partially visible or visible at sufficient distance to be perceptible and result in a low level of change in the view and its composition and a low degree of contrast. The character of the view may be altered, but will remain similar to the baseline existing situation. This change could be short term or of a short duration.</p> <p>The proposed turbines, while appearing to occupy a large vertical extent within the view, are substantially screened by the intervening mature treeline. In addition, although not shown in this photomontage shown here, the remainder of the Proposed Development is likely substantially screened from view from this location.</p>		



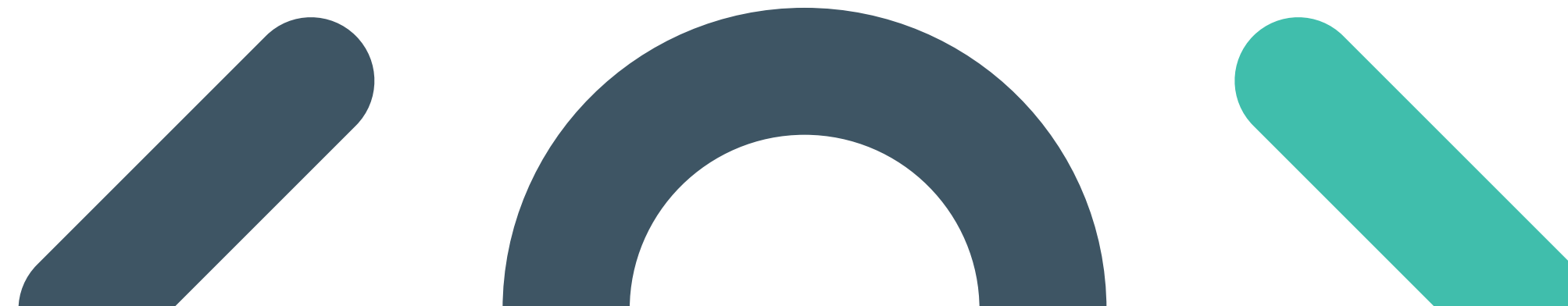
Viewpoint 11 – Sandyhill / Local Property	
Significance of Effect	High x Slight = Moderate/Minor = Moderate (EPA, 2022) An effect that alters the character of the environment in a manner consistent with existing and emerging baseline trends
Mitigation Factors	<ul style="list-style-type: none"> ➤ Sparsely populated section of road with limited numbers of residential receptors. ➤ The majority of the turbines are substantially screened from view by the intervening mature treeline. As the nearest turbine is located behind this treeline within the view, this provides a degree of separation from the Proposed Development for this viewpoint.
Residual Effect (incl. mitigating factors)	Moderate (EPA, 2022) An effect that alters the character of the environment in a manner consistent with existing and emerging baseline trends.



Proposed Lyrenacarriga Wind Farm

Volume 2

Photomontage Booklet



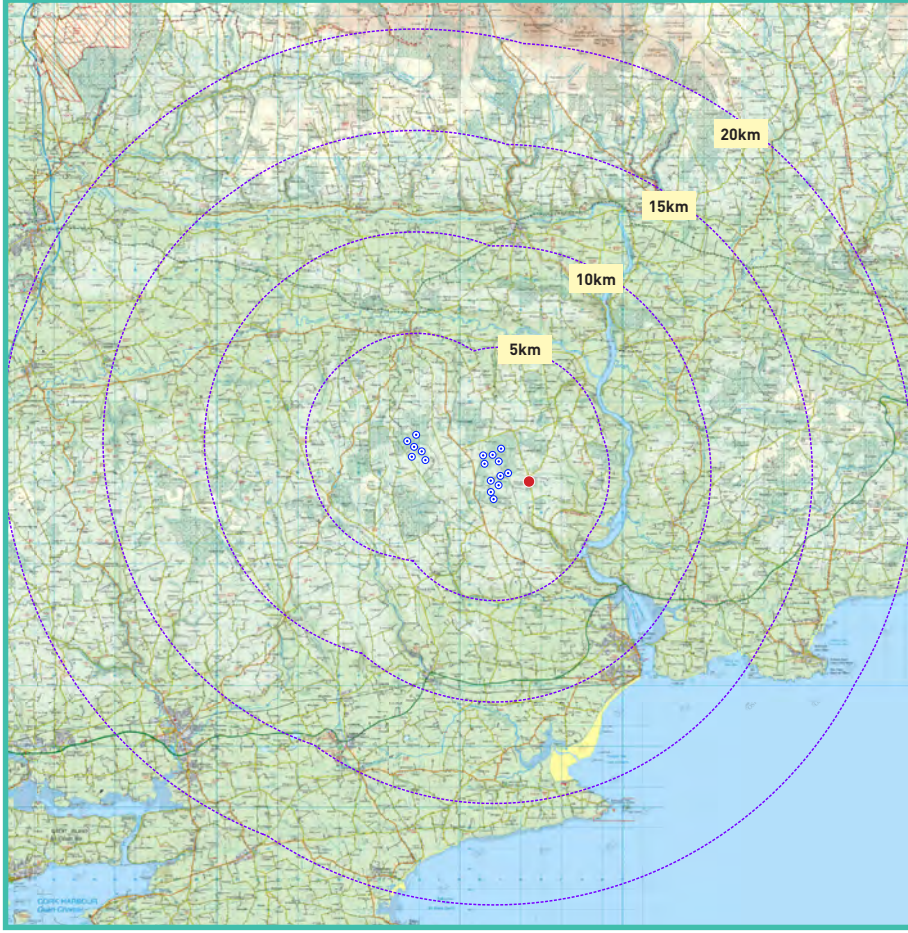
View Point 16

Propoge

Photomontage 16

View Point: View from a local road in the townland of Propoge. This viewpoint is located approximately 1.1 km south-east of the nearest turbine (T6).

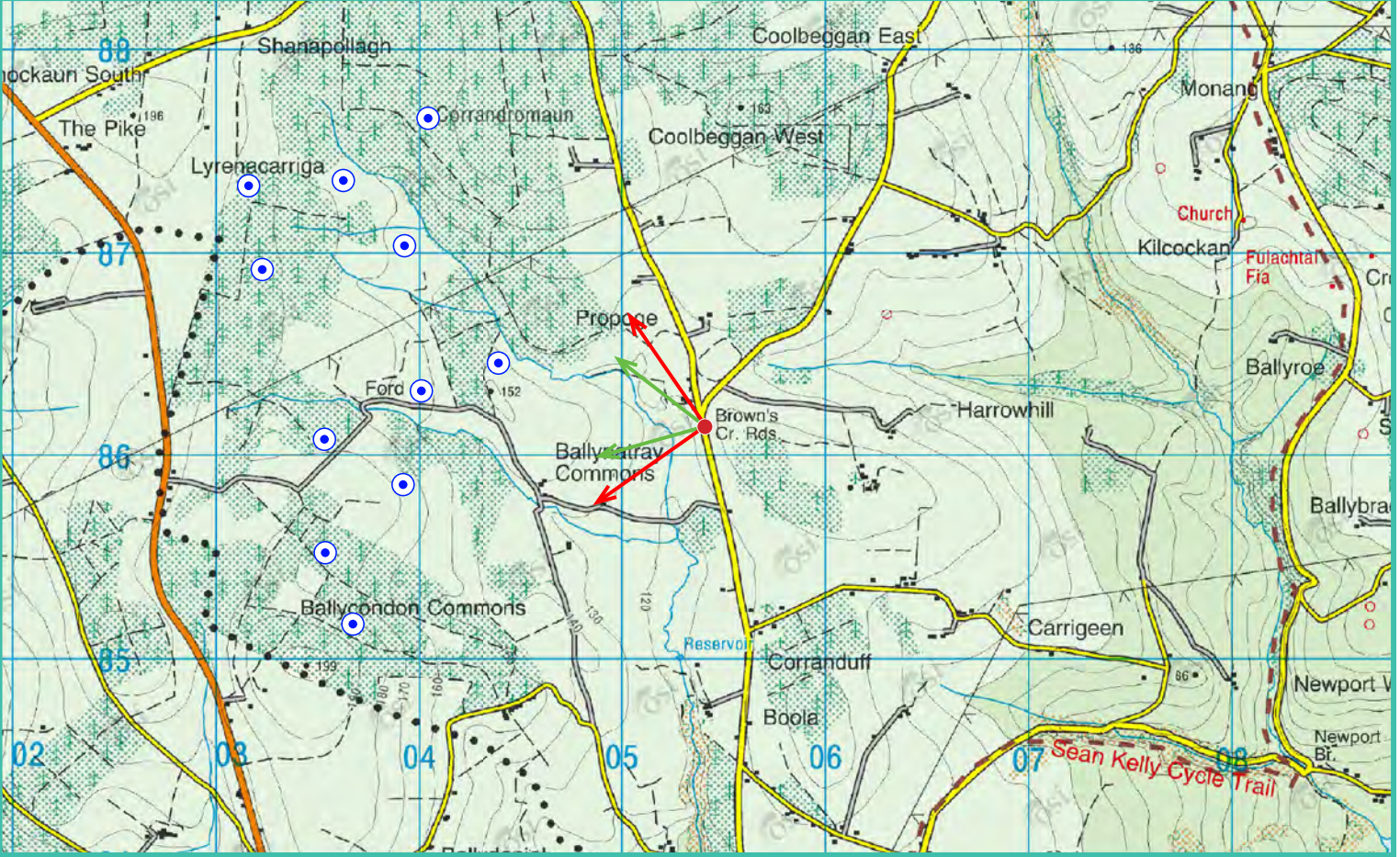
View point grid reference	E 605,350 N 586,168
Date of image taken	17.06.2022
Time of image taken	11:19
View point elevation	134m
Angle of Views	90° / 53.5°
View Direction (Image Centre)	280°
Horizontal extent of proposed turbines	78°
Distance to nearest proposed turbine	1.1km (T6)
Number of proposed turbines visible	16/17
Turbine Hub Height	93.5m
Turbine Tip Height	150m
Turbine Rotor Diameter	113m
Camera	Canon 5D Mark III / Full Frame Sensor.
Lens	50mm Lens
Tripod	Manfrotto 190X extended to approx 1.5m.
Map Licence	© Ordnance Survey Ireland. All rights reserved. Licence number CYAL50267517



View point relative to 20km radius.



View point relative to wind farm site.



Detail of view point location.

Map Legend

- Area shown in 90° view
- Area shown in 53.5° view
- View Point

Wireframe Legend

- Proposed Wind Farm
- Existing Wind Farms
- Proposed Met Mast

Prepared by

MKO
 Planning & Environmental Consultants
 Tuam Road, Galway.
 Tel: (091) 73 56 11
 E-mail: info@mkofireland.ie
 Website: www.mkofireland.ie



90° View Extent

Key Image at 120°

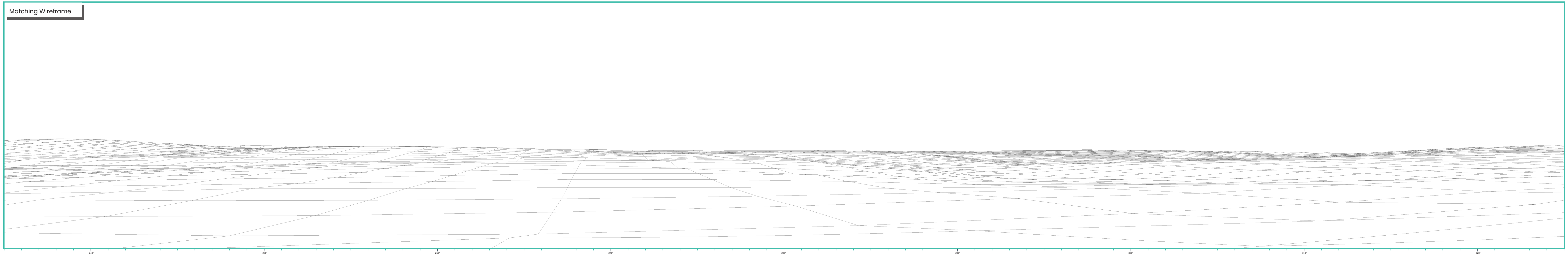


53.5° View Extent

Existing View at 90°



Matching Wireframe

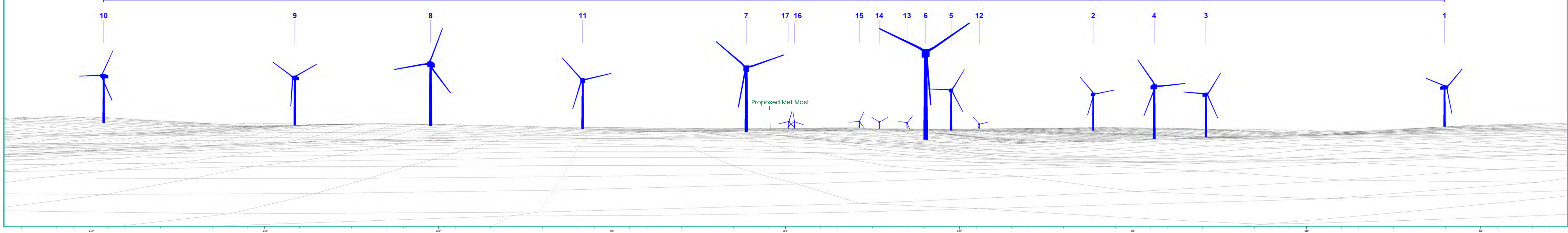


Proposed Photomontage with Cumulative at 90°



Matching Wireframe

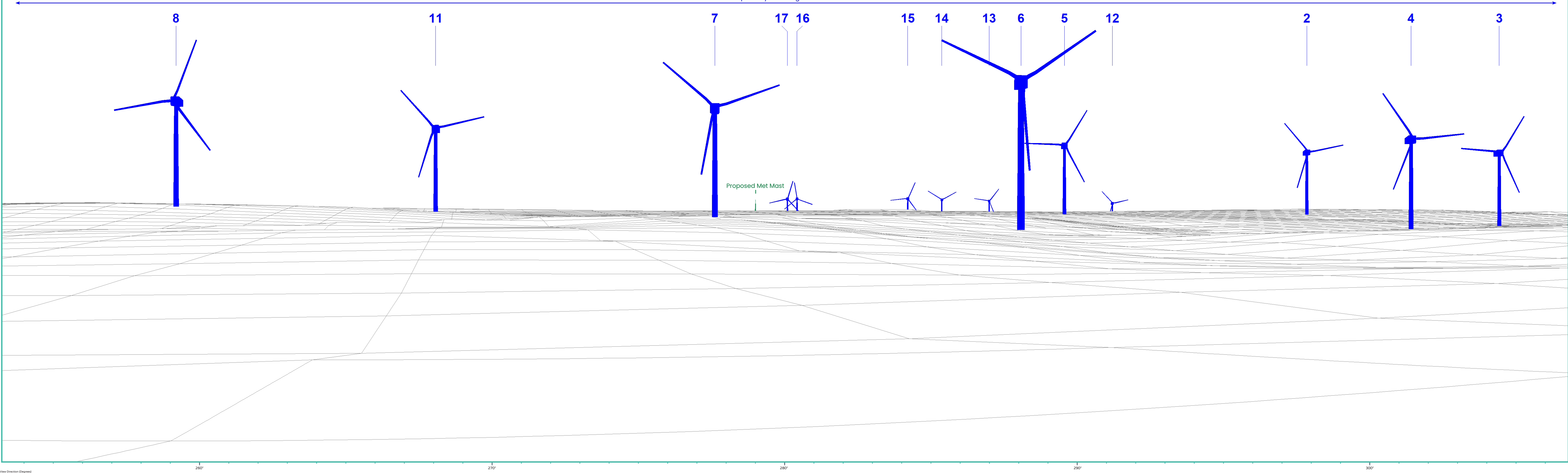
Proposed Lyrenacarriga Wind Farm



Proposed Photomontage with Cumulative at 53.5°



Proposed Lyrenacarriga Wind Farm



TURBINE ENVELOPE MIX

VP16 - Lowest Hub & Longest Blade

Lowest Hub & Longest Blade with Cumulative at 90°



Matching Wireframe

Proposed Lyrenacarriga Wind Farm

Proposed Innogy Lyrenacarriga Wind Farm - Lowest Hub (83.5m) and Longest Blade (66.5m)

