3. CONSIDERATION OF REASONABLE ALTERNATIVES

3.1 INTRODUCTION

This chapter of the Environmental Impact Assessment Report (EIAR) contains a description of the reasonable alternatives that were considered during the iterative design process for the proposed project and relevant to its specific characteristics. It provides a summary of the main reasons for the final options chosen, taking into account the effects of the proposed project on the environment.

Environmental Impact Assessment (EIA) Directive 2011/92/EU, as amended by Directive 2014/52/EU (hereafter referred to as the 'EIA Directive'). Article 5 of the EIA Directive, relating to the preparation of an EIAR by the developer, states the following is to be included regarding alternatives:

> *"...a description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the project on the environment"*(Article 5(1)(d)).

This is further reinforced in Annex IV (Information Referred to in Article 5(1) (Information for the EIAR)) of the EIA Directive which states that:

> *"A description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects."*

The Environmental Impact Assessment of Projects - Guidance on the preparation of the Environmental Impact Assessment Report (European Union, 2017) states that reasonable alternatives:

> *"must be relevant to the proposed project and its specific characteristics, and resources should only be spent on assessing these alternatives" and that "the selection of alternatives is limited in terms of feasibility. On the one hand, an alternative should not be ruled out simply because it would cause inconvenience or cost to the Developer. At the same time, if an alternative is very expensive or technically or legally difficult, it would be unreasonable to consider it to be a feasible alternative"*[1].

In addition, as noted by the EPA in the Guidelines on the Information to be Contained in EIARs (May 2022) *"Analysis of high-level or sectoral strategic alternatives cannot reasonably be expected within a project level EIAR"* and *"that the amended Directive refers to 'reasonable alternatives... which are relevant to the proposed project and its specific characteristics'."*[2]

[1] https://ec.europa.eu/environment/eia/pdf/EIA_guidance_EIA_report_final.pdf

[2] https://www.epa.ie/publications/monitoring--assessment/assessment/EIAR_Guidelines_2022_Web.pdf

The EPA EIAR Guidelines (2022) also stipulates in Section 3.4 (consideration of alternatives) that *'the presentation and consideration of the various alternatives investigated by the developer is an important requirement of the EIA process'*.

In the same section the EPA EIAR Guidelines (2022) discusses the different types of alternatives that may be considered, including:

- Alternative locations;
- Alternative layouts;
- Alternative designs;
- Alternative processes;
- Alternative Mitigation Measures.

This chapter provides information on the consideration of alternatives, including 'do nothing' (see Section 3.4.1), alternative locations (see Section 3.4.2), alternative design and layout, (see Section 3.4.3), and alternative processes (see Section 3.5), amongst other alternative considerations discussed below.

3.2 Statement of Authority

This chapter was co-authored by Lydia Gurley and Dr. John Staunton of TOBIN. Lydia Gurley is an Assistant Project Manager with TOBIN and has a BSc (Hons) and MSc in Chemistry, complemented by postgraduate training in Offshore Renewable Energy and micro-credentials in Project Management and GIS. Lydia brings two years of project-management experience relevant to the planning and development of renewable energy projects. John Staunton is an Associate Project Manager and Environmental Scientist in TOBIN and has 18 years' postgraduate experience in both research and environmental consultancy, with 12 in the latter. John holds a BSc and PhD in Environmental Science, an advanced diploma in Planning and Environmental Law and is a Chartered Environmentalist. He has considerable experience in project managing wind energy developments (for example, Castlebanny Wind Farm, Cloghercor Wind Farm and Scart Mountain Wind Farm) and carrying out EIAR assessments.

This chapter was reviewed by Orla Fitzpatrick, Technical Director in TOBIN. Orla has twenty years' experience working in the delivery of EIA projects in environmental consultancy. She is a Chartered Environmentalist and has considerable experience as technical approver of environmental deliverables for renewable projects, including Ballyfasy Wind Farm, Scart Mountain Wind Farm and Cloghercor Wind Farm.

3.3 Methodology

3.3.1 Standards and Guidance Documents

The following documents and guidance were reviewed and complied with within the chapter:

- Environmental Protection Agency (EPA) (2022) Guidelines on the Information to be contained in EIARs;
- Environmental Impact Assessment of Projects - Guidance on the preparation of the EIAR (European Union, 2017);
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Local Government

and Heritage (previously the Department of Housing, Planning and Local Government), 2018);

The assessment of reasonable alternatives has also been informed by: :

- Best Practice Guidelines for the Irish Wind Energy Industry (IWEA, 2012).

3.3.2 Approach to Alternatives

The Environmental Impact Assessment of Projects - Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017) states that reasonable alternatives *"must be relevant to the proposed project and its specific characteristics, and resources should only be spent on assessing these alternatives" and that "the selection of alternatives is limited in terms of feasibility. On the one hand, an alternative should not be ruled out simply because it would cause inconvenience or cost to the Developer. At the same time, if an alternative is very expensive or technically or legally difficult, it would be unreasonable to consider it to be a feasible alternative"*.

The objective for the Applicant was to identify a site capable of accommodating a 50–60 MW wind energy project and to develop the project layout in accordance with the Mayo County Development Plan (CDP) 2022-2028 and associated Renewable Energy Strategy that was in force at the time of site selection and design, ensuring alignment with the plan's provisions for wind-energy development.

Other technology types (such as solar) have not been assessed as this is not in line with the project objectives to develop a wind farm and to maximise the energy capacity output from a zoned site in line with targets and objectives.

3.4 Consideration of Alternatives

In accordance with the EIA Directive taking into account the above standards and guidance documents listed, and in accordance with best practice in our professional experience, including the EPA EIAR Guidelines (2022), this chapter addresses alternatives under the following headings:

- 'Do Nothing' Option, (i.e. without the proposed project proceeding);
- Alternative Locations/Site Selection;
- Alternative Layouts/ Design;
- Alternative Technology; and
- Alternative Timeline/Lifespan and Construction Methodology.

Each of these is addressed in the following sections along with alternative mitigation measures considered. When considering a wind farm development, given the intrinsic link between turbine layout and design, the two will be considered together in this chapter. All three phases of the proposed project (construction, operation and decommissioning) have been assessed throughout with certain phases specified where appropriate.

3.4.1 'Do-Nothing' Option

The "Do-Nothing" scenario is to not develop the proposed project and to leave the existing environment as it is, with no changes made to the current land-use practices.

In such a scenario, the prospect of capturing a valuable renewable energy resource would be lost and as a result the opportunity to contribute to meeting Government and EU targets to produce electricity from renewable resources and the reduction of greenhouse gas (GHG) emissions would also be lost. Furthermore, the chance to generate additional local employment and investment would not occur, the local economy would remain less diverse, and continue to rely primarily on agriculture as its main source of income.

The 2009 EU Renewable Energy Directive (2009/28/ EC) (anecdotally referred to as RED I) set Ireland a legally binding target to meet 16% of our energy requirements from renewable sources by 2020. In 2018, the Directive was recast (2018/2001/EU) (RED II) to move the legal framework to 2030 targets, setting a new binding target of at least 32% with a clause for a possible upwards revision by 2023. The RED II Directive was amended by the RED III Directive (EU/2023/2413), which entered into force on 20 November 2023. The RED III Directive has been partially transposed into Irish legislation by way of the European Union (Planning and Development) (Renewable Energy) Regulations 2025 (S.I. 274 of 2025) with the majority of the provisions coming into effect on 7th August 2025. RED III sets an EU-wide target of 42.5% renewable energy consumption by 2030. In July 2024, Ireland set its national contributions to this target in its updated NECP. Ireland's overall RES target is now 43% by 2030. Ireland's renewable energy share of gross primary energy consumption was 14.6% in 2024[3], which remains significantly below the RED III and adopted NECP target.

The Climate Action Plan 2025 (CAP25), published on April 15, 2025, marks the fourth annual update to Ireland's Climate Action Plan. Similar to CAP24, CAP25 aims to expedite the deployment of onshore wind, targeting up to 9GW by 2030. The plan emphasises the necessity for rapid and substantial reductions in greenhouse gas emissions to meet the 2015 Paris Agreement and the UN's Sustainable Development Goals. Additionally, it highlights the importance of the revised National Planning Framework (NPF), which supports the development of electricity grid infrastructure by establishing regional renewable electricity capacity targets for 2030.

According to recent figures published by Wind Energy Ireland, the total installed onshore wind capacity in Ireland in February 2026 was just over 5 GW, therefore a further 4 GW is required to be installed between 2026 and 2030 to meet the binding CAP target of 9GW.

Under the "Do-Nothing" scenario, the proposed project would not go ahead, the development of wind turbines would not be pursued, and all lands associated with the proposed project would remain in their current uses (primarily agriculture). The prospect of creating sustainable energy would be lost at this site. The nation's ability to produce sustainable energy and reduce GHG emissions to meet EU targets and targets set out in the CAP25 would be reduced.

[3] https://www.seai.ie/data-and-insights/seai-statistics/key-publications/energy-in-ireland?gad_campaignid=9583667516&gad_source=1 (Accessed 17th September 2026)

The proposed project will abate Ireland's greenhouse gas emissions by approximately 34,600 t CO_2e for every year of operation or over 1,200,000 t CO_2e will be displaced over the proposed 35-year lifetime, see EIAR Chapter 15. In a "Do-Nothing" scenario these savings would not occur.

Importation and use of fossil fuels would continue, and Ireland's energy security would remain vulnerable. According to EirGrid's All-Island Generation Capacity Statement 2021 – 2030, the growth in energy demand for the next ten years will be between 18% (low demand scenario) and 43% (high demand scenario)[4].

In addition, the proposed project will provide employment both in the local area and to the wider economy through the construction, operational and decommissioning phases as described in EIAR Chapter 5. As detailed in EIAR Chapter 2, Section 2.5, the proposed project has the potential to bring significant positive benefit to the local community. The project will contribute annual rates to the local authority, and it will provide opportunity for local community investment in the project in line with the Renewable Energy Support Scheme (RESS) estimated at over €4 million euros over the first 15 years of the project. Under the 'Do-Nothing' scenario, the socio-economic benefits associated with the proposed project will be lost.

In summary, for the scenario where the proposed project does not proceed, the opportunity to contribute to meeting Government and EU targets for the production and consumption of electricity from renewable resources and the reduction of greenhouse gas emissions would be lost. The do-nothing assessment is provided in Table 3- 1.

Table 3- 1 : Summary of the Do-Nothing Alternative

Environmental Consideration	Do Nothing Alternative
Human Health and Population	No increase in employment as a result of the proposed project. No long-term investment in sustainability in the locality. No potential for construction/operation/decommissioning phase effects. No community benefit fund.
Biodiversity	Agriculture would continue to be practiced as it currently is. No potential for construction/operation/decommissioning phase effects associated with the proposed project. No ecological enhancement works would occur.
Ornithology	No potential for construction/operational/decommissioning phases effects to bird populations.
Land, Soils and Geology	Lands would continue to be used predominantly for agriculture purposes. No potential for construction/operation/decommissioning phase effects.
Hydrology and Hydrogeology	Lands would continue to be used predominantly for agriculture purposes. Watercourses and hydrological features will continue to have similar properties with the agricultural activity having ongoing effects on water quality.

[4] http://www.eirgridgroup.com/site-files/library/EirGrid/208281-All-Island-Generation-Capacity-Statement-LR13A.pdf

	No potential for construction/operation/decommissioning phase effects.
Shadow Flicker	No potential for construction/operation/decommissioning phase shadow flicker effects, however, the Applicant has committed to virtually eliminate adverse shadow flicker (i.e. near zero shadow flicker) for the proposed project by adopting mitigation measures using control software allowing for a brief time period for the turbine rotor to come to a safe stop (see Chapter 10).
Material Assets	No potential for effects on telecommunication links, aviation activity and other Material Assets for construction/operational/decommissioning phases. However, the Applicant has committed to avoiding effects on telecommunications links for the proposed project. The availability of the airspace within and around the proposed wind farm site would have no restrictions for local air traffic, with no attraction for aircraft in the immediate area around the proposed wind farm site. No potential for significant effects on other Material Assets as existing services would remain in place.
Air Quality	No potential for construction/ decommissioning phase adverse effects such as dust emissions. Missed opportunity for operational phase to contribute to the reduction of burning fossil fuels with associated improvement in air quality.
Climate	Missed opportunity to contribute to the reduction of carbon and greenhouse gas emissions.
Noise and Vibration	No potential for additional noise at nearby sensitive receptors for construction/operational/decommissioning phases.
Cultural Heritage	No potential effects on archaeology or local cultural heritage for construction/operational/decommissioning phases.
Landscape and Visual Impact	Existing landscape and visual amenity in the area will remain unchanged for construction/operational/decommissioning phases, resulting in no potential effects.
Traffic	No potential increase in traffic volumes on local roads for all phases. No works required at existing or new entrances for the proposed wind farm site, temporary works along the turbine delivery route or for construction of the grid connection.

3.4.2 Alternative Locations/Site Selection

The site selection process for wind farm development is guided by high-level plans, strategies and guidance such as the Mayo CDP 2022-2028, the Draft Revised 2019 WEDGs and the 2006 WEDGs.

These documents set out appropriate areas and development guidance for wind farm development which is considered at an early stage of site selection to ensure only suitable sites are considered for wind energy projects. In terms of alternatives, the EPA EIAR Guidelines (2022) states the following:

> *"Higher level alternatives may already have been addressed during the strategic environmental assessment of relevant strategies or plans. Assessment at that tier is likely to have taken account of environmental considerations associated, for example, with the cumulative impact of an area zoned for industry on a sensitive landscape. Note also that plan-level/higher-level assessments may have set out project-level objectives or other mitigation that the project and its EIAR should be cognisant of. Thus, these prior assessments of strategic alternatives may be taken into account and referred to in the EIAR."*

The Applicant, Rooaunalaghta Green Energy Ltd., examined lands for candidate sites suitable for wind energy development. In 2021, the Applicant's Development Team undertook a detailed screening process, through Geographical Information System (GIS) software, using a number of criteria and stages to assess the potential of a large number of possible sites suitable to accommodate a wind energy development in County Mayo.

The GIS database drew upon a wide array of key spatial datasets such as forestry data, ordnance survey land data, house location data, transport, existing wind energy and grid infrastructure data, and environmental data such as ecological designations, landscape designations and wind energy strategy designations available at the time.

The following is a summary of the methodology used in this site selection process.

Phase 1 – Initial Screening

This stage in the selection process discounted lands that were not available for development under a number of criteria, as follows:

- Committed Lands for other developments;
- Farm Partnerships and Leased Lands;
- National Parks; and
- European and Nationally Designated Sites (SAC, SPA, NHA, pNHA).

The Applicant also reviewed the then current Renewable Energy Strategy (RES) for Co. Mayo 2011-2020 provisions and did not proceed with further analysis where the policy context was not supportive of wind farm development. In this regard, areas were not brought forward for further analysis if they were not identified as being at least "open for consideration" for wind farm development.

Lands where the average wind speed at 75 metres above ground level is less than 7 m/s and, therefore, potentially not suitable for a commercially viable wind energy development were also discounted at this stage.

Phase 2 – Potential for Grid Connection

The electricity transmission system is the backbone of the nation's power system, efficiently delivering large amounts of power from where it is generated to where it is needed. As part of the site selection process, it was necessary to consider the potential for grid connection, including in terms of distance to potential connection nodes and the grid capacity at the nodes, in the local area, to accommodate the connection.

Phase 3 – Other Constraints

The next stage of the screening process removes lands from further analysis with the following attributes:

- Sensitive Rural Landscape or Scenic Areas designation in Mayo CDP 2022 – 2028;
- Tourist areas/sites/trails;
- Constrained size of Site or Development Area;
- Lands utilised for other wind farm developments;
- Telecommunications masts and links;
- Sensitive habitat/species of bird;
- Land with ownership title issues;
- Residential density in vicinity;
- Unfavourable slopes and ground conditions.

This stage of screening was generally applied using the Applicant's in-house expertise and local knowledge and was subsequently validated externally in terms of the engineering considerations and the likelihood of obtaining a successful grant of planning permission. This included relevant ACP decisions and precedents, to inform the assessment of site suitability and the likelihood of obtaining planning permission.

The Applicant has used this site screening approach successfully at other potential project locations.

The application of the above criteria resulted in the identification of four potential sites in Mayo (Number one to four in Table 3- 2). Table 3-2 presents an overview of the four alternative layouts considered, while Figure 3-1 to Figure 3-4 provide a detailed outline of each alternative layout. These are based upon the Mayo CDP 2022-2028 designations in effect at the time of site selection, indicative housing setbacks, and other known constraints.

Table 3- 2 outlines the four sites identified, assesses them against the criteria, highlights potential environmental effects and reasons for not proceeding with three of these. Through the site selection process, the proposed wind farm site was identified as the preferred candidate site to take through the next stage of validation and design iterations.

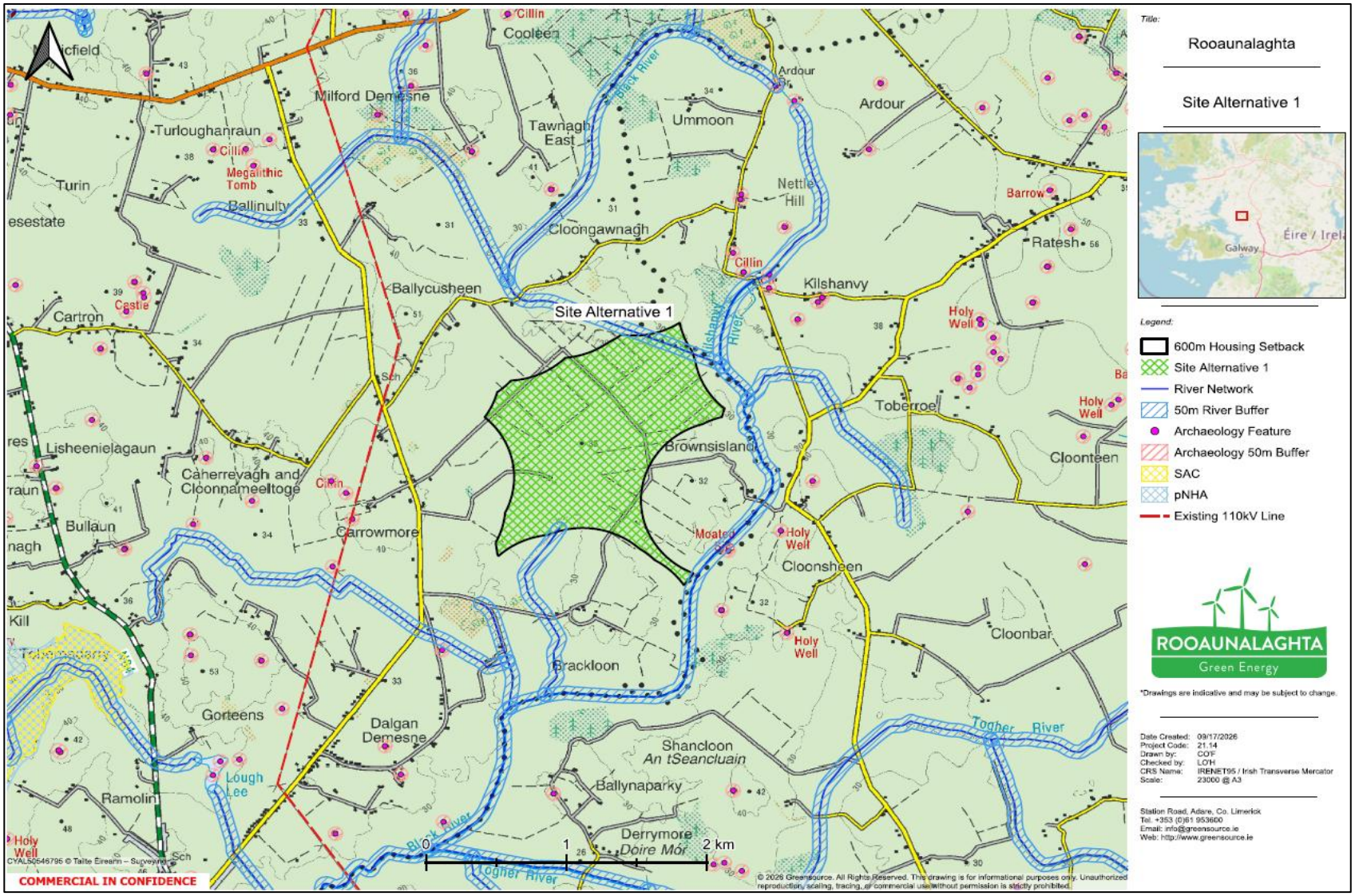


Figure 3-1: Alternative layout 1

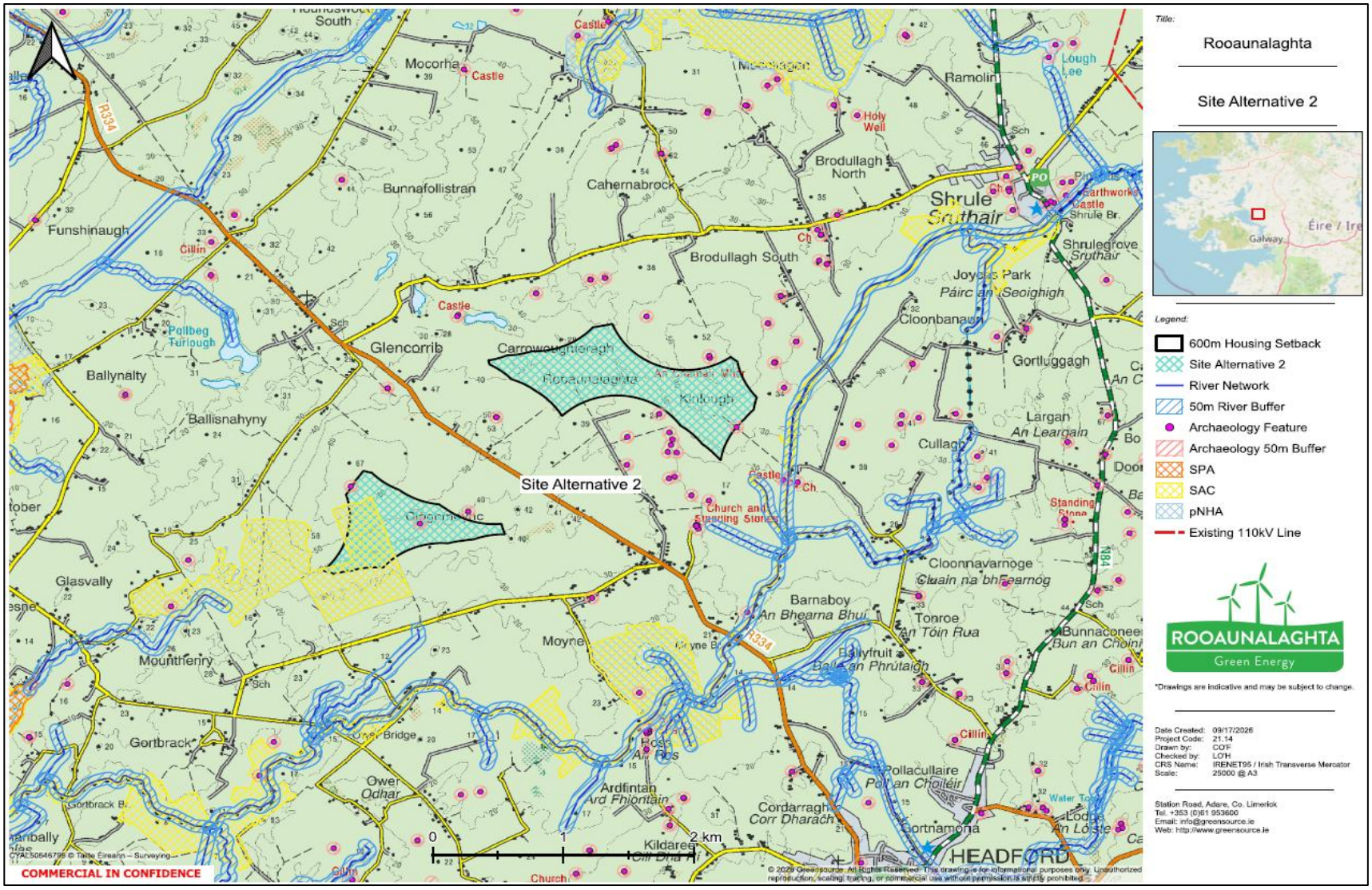


Figure 3-2: Alternative layout 2

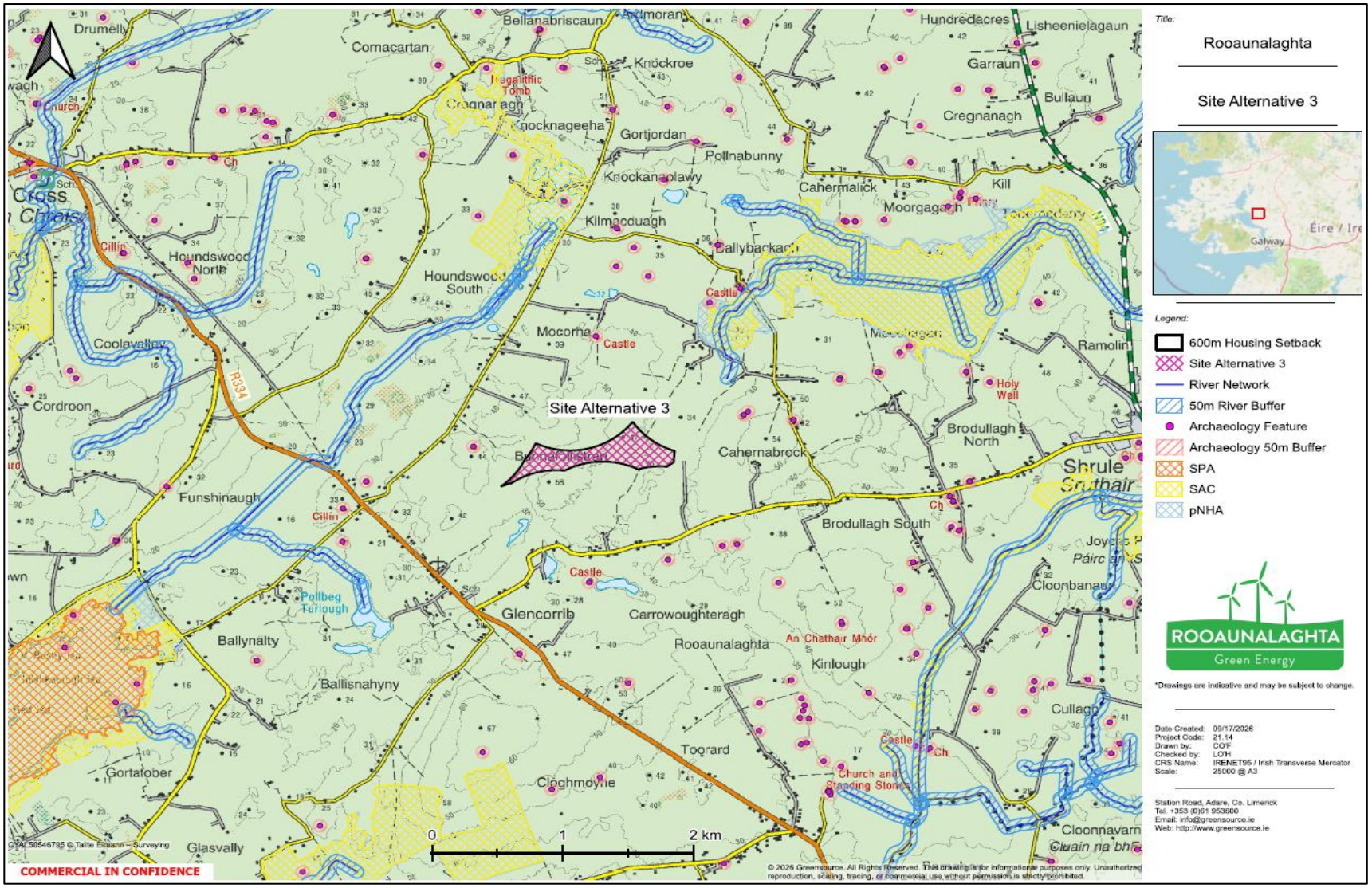


Figure 3-3: Alternative layout 3

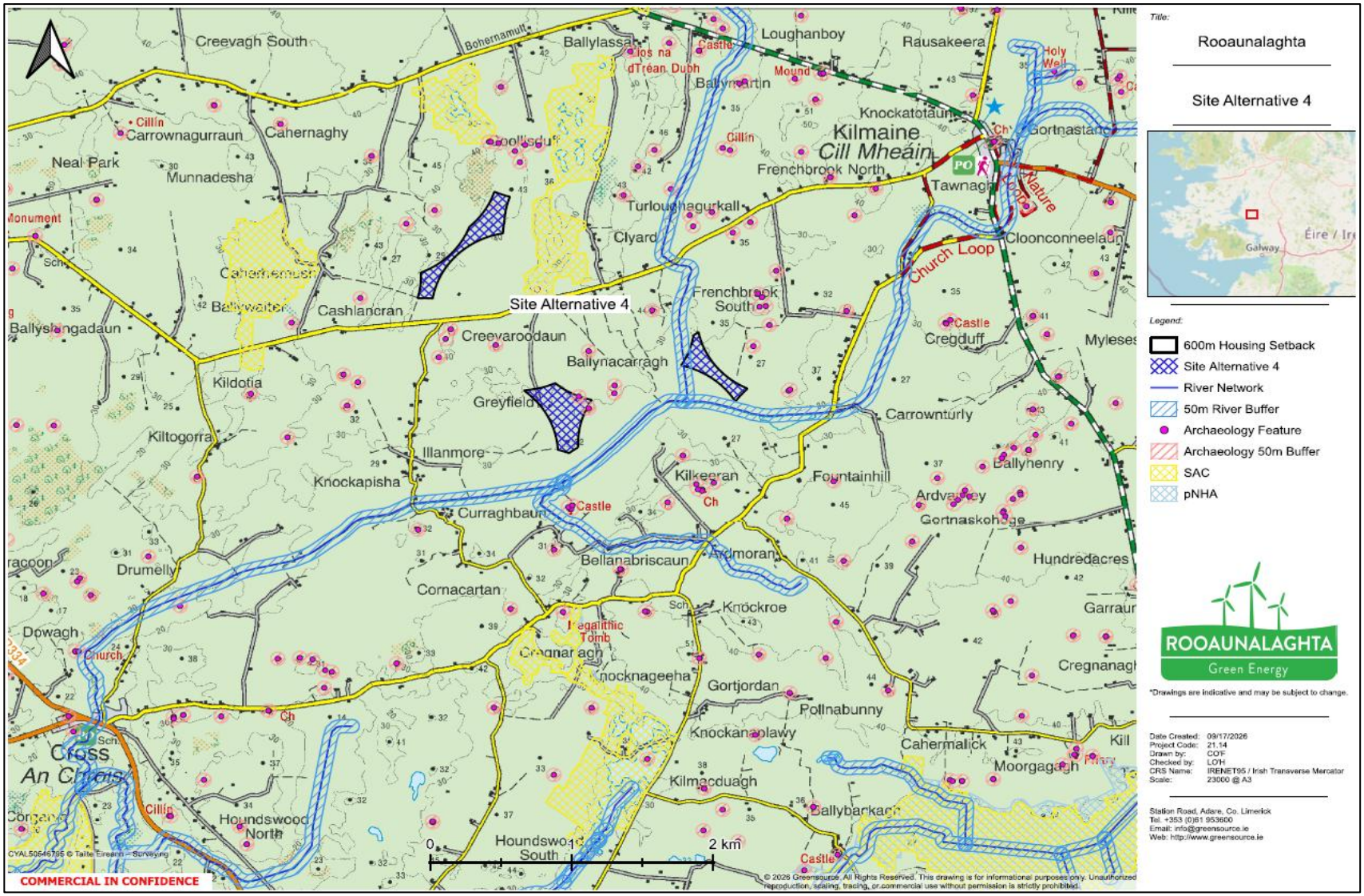


Figure 3-4: Alternative site 4

3.4.2.1 Selection of Candidate Site

The proposed wind farm site at Cloughmoyne and Rooaunalaghta, Option 2 inTable 3- 2, approximately 2.5 km southwest of Shrule, Co. Mayo and approximately 3.5 km northwest of Headford, Co. Galway was the candidate site brought forward for more detailed analysis. Following phase 1 - 3 of the site selection process the proposed wind farm site was the candidate site brought forward as it most successfully met the key criteria for wind energy development. The proposed wind farm site was selected based on the following opportunities and constraints, as further detailed in Table 3- 2:

- Grid Access, Capacity and Proximity to the national grid;
- Positive planning policy / zoning (at the time of site selection. See Chapter 4 and the Planning Statement for further information);
- Proximity to Houses, distance from settlements and residential properties;
- Availability of good wind resource / speed in the area;
- Constraints and environmental sensitivities and designations (avoidance of European sites and other nationally designated sites);
- Landscape capacity to absorb a wind farm; and
- Accessibility, and road network;
- Land Use;
- Acceptable level of Telecommunication, Archaeological, Geotechnical and Hydrological constraints.

Table 3- 2: Summary of the key findings during Site Selection

Criterion	Site 1	Site 2 (Preferred site)	Site 3	Site 4
Site Description	Site 1 was a potential site located within a "Preferred Cluster" designation in the Mayo CDP 2022-2028 in force at the time of the site screening. The site could accommodate 9-10 wind turbines with an output in the region of 45-50 MW for wind farm development.	Site 2 is a potential site located within an "Open to Consideration" designation in the Mayo CDP 2022-2028 in force at the time of the site screening. The site is a combination of two clusters, the south western cluster suitable to accommodate 4 wind turbines and the north eastern cluster could accommodate 9 wind turbines with an output in the region of 50 – 60 MW for wind farm development. The site consists primarily of improved agricultural grassland and relatively flat topography. There is sufficient set-back from dwellings to facilitate a site consisting of 13 wind turbines.	Site 3 location could potentially facilitate up to 5 wind turbines in an area that was designated as "Open to Consideration" in the Mayo CDP 2022-2028 in force at the time of the site screening. The site consists primarily of improved agricultural grassland and relatively flat topography. There is sufficient set-back from dwellings to facilitate a site consisting of up to 5 wind turbines with an output in the region of 25 – 30 MW for wind farm development.	Site 4 location is a cluster of 3 potential sites, separated approximately 1 km from each other. The sites combined could facilitate up to 9 turbines, 4 turbines in the northern cluster, 3 turbines in the south west cluster and 2 turbines in the south east cluster with a combined potential output of 40-45 MW.
Grid Access/Capacity and Proximity to the national grid	Site 1 was identified as being well located in terms of proximity to existing grid infrastructure and the availability of suitable grid capacity. The existing Dalton to Cashla 110 kV Overhead Line (OHL) runs approximately 1 km to the west of the site. The proposed solution was identified as the development of a new 110 kV loop in substation, designed to provide a secure and technically	Site 2 was identified as being well located in terms of proximity to existing grid infrastructure and the availability of suitable grid capacity. The existing Dalton to Cashla 110 kV Overhead Line (OHL) runs approximately 5 km to the East of the site and could be connected predominantly within the public road network. The Applicant engaged specialist grid consultants to assess the full range of feasible	Site 3 would have a potential maximum export capacity of 25 MW and would be connected at 38 kV. The closest 38 kV node is Headford 38 kV substation which is located circa 7.5 km from the site location. This site location was ranked third when considered against the other site locations and would result in a moderate construction phase	Site 4 location is a cluster of 3 potential sites, separated approximately 1 km from each other. The sites combined could facilitate up to 9 turbines, 4 turbines in the northern cluster, 3 turbines in the south west cluster and 2 turbines in the south east cluster with a combined potential output of 40-45 MW, which could connect at either

	robust connection point to the transmission network. This site location was best location of the 4 sites considered and would result in the least amount of construction phase effects.	connection options for the project. Following this assessment, the preferred solution was identified as the development of a new 110 kV loop-in substation, designed to provide a secure and technically robust connection point to the transmission network. This site location was considered the second-best location of the 4 sites considered and would result in a minimal amount of construction phase effects, mostly related to local traffic disruption during construction.	effects, mostly related to local traffic disruption during construction.	38 kV or 110 kV. The closest connection point to the existing 110 kV OHL from Dalton to Cashla to the west of the site and is possible to connect via the public road network. at 110 kV (10 km). Alternatively, the project could connect to the 38 kV network at Cong 38 kV substation which is circa 12 km via the public road network. This site location was ranked fourth when considered against the other site locations due to the complexity of interconnection in the cluster and the distances involved. This would result in a moderate construction phase effects, mostly related to local traffic disruption during construction.
County Development Plans and Zoning	Site 1 was a potential site located within a "Preferred Cluster" designation in the Mayo CDP 2022-2028 in force at the time of the site screening.	The proposed project was in a Tier 2 area, "Open for Consideration" as part of the Renewable Energy Strategy (RES) for Co. Mayo 2011-2020 which was still the valid RES for the county through the design phase of the project (See Figure 4-5, in Chapter 4). An updated RES was	Site 3 location could potentially facilitate up to 5 wind turbines in an area that was designated as "Open to Consideration" in the Mayo CDP 2022-2028 in force at the time of the site screening.	Site 4 was in an area that was designated as "Open to Consideration" in the Mayo CDP 2022-2028 in force at the time of the site screening. Site 4 had the same designation in the CDP as Site

	This made Site 1 the most attractive designation when compared to the other site options	adopted in July 2026. Any implications for renewable energy development in Mayo are examined in detail in Chapter 4 and the Planning Statement included as part of the planning application. Site 2 had the same designation in the CDP as Site 3 and 4, which were not as attractive as Site 1.	Site 3 had the same designation in the CDP as Site 2 and 4, which were not as attractive as Site 1.	2 and 3, which were not as attractive as Site 1.
Proximity to Houses, distance from settlements and residential properties	In general, Site 1 is located in cutover bog and is surrounded by agricultural land. Given the extent of the land, it was considered that the design setback is in excess of the current 2006 WEDGs, which references a 500 m setback distance. In addition, it complies with the setback distance recommendation of 4 x tip height (600 m) (as stated in the Draft Revised 2019 WEDGs).	In general, Site 2 is surrounded by agricultural land. Given the extent of the land, it was considered that the design setback is in excess of the current 2006 WEDGs, which references a 500 m setback distance. In addition, it complies with the setback distance recommendation of 4 x tip height (600 m) (as stated in the Draft Revised 2019 WEDGs).	In general, Site 3 is surrounded by agricultural land. Given the extent of the land, it was considered that the design setback is in excess of the current 2006 WEDGs, which references a 500 m setback distance. In addition, it complies with the setback distance recommendation of 4 x tip height (600 m) (as stated in the Draft Revised 2019 WEDGs).	In general, Site 4 is a cluster of 3 sites which are surrounded by agricultural land. Given the extent of the land, it was considered that the design setback is in excess of the current 2006 WEDGs, which references a 500 m setback distance. In addition, it complies with the setback distance recommendation of 4 x tip height (600 m) (as stated in the Draft Revised 2019 WEDGs).
Wind Resource Assessment	The Wind Atlas mean wind speed was determined for the proposed wind farm site and was considered to be suitable in the context of operational efficiency and the nature of modern-day turbine technology. The 2013 SEAI Wind Speed Atlas identifies the proposed wind farm site as having a wind speed of between 7.5 m/s and 7.6 m/s at 100 m	The Wind Atlas mean wind speed was determined for the proposed wind farm site and was considered to be suitable in the context of operational efficiency and the nature of modern-day turbine technology. The 2013 SEAI Wind Speed Atlas identifies the proposed wind farm site as having a wind speed of between 7.5 m/s and 7.6 m/s at 100 m above ground level,	The Wind Atlas mean wind speed was determined for the proposed wind farm site and was considered to be suitable in the context of operational efficiency and the nature of modern-day turbine technology. The 2013 SEAI Wind Speed Atlas identifies the proposed wind farm site as having a wind speed of between 7.5 m/s and 7.6 m/s at 100 m above ground level,	The Wind Atlas mean wind speed was determined for the proposed wind farm site and was considered to be suitable in the context of operational efficiency and the nature of modern-day turbine technology. The 2013 SEAI Wind Speed Atlas identifies the proposed wind farm site as having a wind speed of

	above ground level, identifying the site as a suitable candidate for wind energy.	identifying the site as a suitable candidate for wind energy.	identifying the site as a suitable candidate for wind energy.	between 7.4 m/s and 7.5 m/s at 100 m above ground level, identifying the site as a suitable candidate for wind energy.
Ecological Sensitivity	There are no NHAs located immediately adjacent to the site. The Shrule Turlough pNHA is located approximately 2.5 km west of the site. This pNHA largely overlaps with the Shrule Turlough SAC. The site is a mix of cutover bog and agricultural land. Large sections of the cutover bog appear to be revegetated and have the potential to regenerate and act as a carbon sink. In order to construct a project on this site, peat would have had to be removed reducing the carbon sink available. The site has unfavourable ground conditions as the site is located on degraded peatland with active turf-cutting and significant turbary rights on much of the lands. The number of landowners within the site is numbered in the hundreds, which could result in ownership title issues.	There are no NHAs located immediately adjacent to the proposed wind farm site. The Cloughmoyne pNHA occurs adjacent to the site along its southwest boundary. This pNHA largely overlaps with Cloughmoyne SAC, which has been designated for Annex I limestone pavement habitat. Rostaff Turlough pNHA is located approximately 1.5 km southeast of the proposed wind farm site. Lough Corrib SAC extends in a northeast-southwest orientation to the east of the proposed wind farm site and occurs approximately 150 m from the eastern boundary of the wind farm site at its closest point. There are no SPAs located within the footprint of the proposed wind farm site; however, Lough Corrib SPA is hydrologically connected to the proposed development. The site has a large footprint and with careful design consideration, potential environmental effects on the pNHA and the SAC's can be avoided or mitigated.	There are no NHAs located immediately adjacent to the site. The Shrule Turlough pNHA is located less than 1 km north east of the site. This pNHA largely overlaps with the Shrule Turlough SAC. The site is predominantly agricultural grassland with areas of exposed bedrock, similar to Site 2. Potential environmental effects would include, ornithology and ecology at Shrule lough and its surrounds. Careful consideration in the design and application of site specific mitigation measures could avoid significant effects.	There are no NHAs located immediately adjacent to the proposed wind farm site. The Clyard Kettle-Holes pNHA occurs adjacent to the site along the eastern boundary of the northern cluster. This pNHA largely overlaps with Clyard Kettle-Holes SAC, which has been designated for Turloughs and Clacareous fens. Mocorha Lough SAC is located approximately 1.5 km south of the site. There are no SPAs located within the footprint of the proposed wind farm site. The site is predominantly agricultural grassland but is split over a cluster of 3 separate areas. Potential environmental effects would include, Hydrology, geology and ecology at Clyard Kettle-Holes SAC and its surrounds. Careful consideration in the design and application of site specific mitigation measures could avoid significant effects.

	The site is also on the boundary of the Black River, which forms part of the lough Corrib SAC.	The site is predominantly agricultural grassland with areas of exposed bedrock. Potential environmental effects would include, Hydrology, geology ornithology and ecology at Lough Corrib and Cloughmoyne SAC surrounds. Careful consideration in the design and application of site specific mitigation measures could avoid significant effects.		
Landscape Capacity/ Cumulative Effect	There are two operational wind farms within 20 km, whether considered in isolation or cumulatively with nearby existing wind energy developments, will give rise to visual effects that are classified as Not Significant.	There are two operational wind farms within 20 km of the proposed wind farm site namely; Ugool and Seecon. As noted in Chapter 13, the proposed project, whether considered in isolation or cumulatively with nearby existing wind energy developments, will give rise to visual effects that are classified as Not Significant.	There are two operational wind farms within 20 km, whether considered in isolation or cumulatively with nearby existing wind energy developments, will give rise to visual effects that are classified as Not Significant.	There are two operational wind farms within 20 km, the proposed project, whether considered in isolation or cumulatively with nearby existing wind energy developments, will give rise to visual effects that are classified as Not Significant.
Supporting transport Infrastructure	The site would be accessed via the local road network (L7616) which would likely require substantial widening and potentially strengthening works to facilitate materials delivery (stone, steel and concrete) as well as the delivery of large oversize components such as turbine blades, tower sections, etc. Ground conditions close to the site location are underlain with peat and work require peat	The proposed wind farm site will be accessed via two proposed entrances, both located off the R334 Regional Road which are considered to facilitate both materials delivery (stone, steel and concrete) as well as the delivery of large oversize components such as turbine blades, tower sections, etc. For further information see Chapter 17 and the Traffic Management Plan (TMP) (Appendix 17-1).	The site will be accessed via either the R334 Regional Road or the L1615 local road. The L1615 would require some widening at bends along the local road to facilitate both materials delivery (stone, steel and concrete) as well as the delivery of large oversize components such as turbine blades, tower sections, etc.	The site will be accessed via either the local road network and would require substantial widening and tree pruning and furniture removal along the local road network. The R334 Regional Road would be utilised up to the village of Neale, where widening at the junction on to the local road would be required. The works along the local road would be required to facilitate both materials delivery (stone, steel

	extraction, storage and management.	The site accesses/entrances will remain in place during the operation and decommissioning phases as they will facilitate access for operation and maintenance vehicles as well as the delivery of any wind turbine components that may require replacement/upgrade. The proposed site entrances will have adequate visibility as also discussed in Chapter 17.		and concrete) as well as the delivery of large oversize components such as turbine blades, tower sections, etc.
Land Use	The existing soil cover is predominately Peat, with pockets of improved and wet grasslands. It is mostly cutover bog with evidence of historical peat extraction, with some areas of agricultural grassland grazing.	The land use/activities on the proposed wind farm site are primarily agriculture. The proposed wind farm site has a maximum elevation of 60 m AOD (Above Ordnance Datum) to a low of 25 m AOD. Based on the above, the land use at the site was found to be compatible with wind farm installation.	The land use/activities on the proposed wind farm site are primarily agriculture. Based on the above, the land use at the site was found to be compatible with wind farm installation.	The land use/activities on the proposed wind farm site are primarily agriculture. Based on the above, the land use at the site was found to be compatible with wind farm installation.
Flood Plain Analysis	Only a small, localised area within the site is located in the OPW flooding zones associated with the Black River, which is limited in extent. No past flood events have been mapped within the proposed site. As such, these minor pluvial features do not present a constraint to the development.	Only a small, localised area within the proposed wind farm site is located in the GSI Groundwater flooding zones, which is limited in extent and not located near any of the proposed infrastructure or works. No past flood events have been mapped within the proposed wind farm site. The proposed turbine foundations will be set above existing ground levels, ensuring that any localised surface-water accumulation does not interact with turbine	No areas within the site are identified as being located within a flood zone.	Two southern clusters are partially located within a flood plain associated with the Kilmaine/Cross River.

		infrastructure. As such, these minor pluvial features do not present a constraint to the development. Surface water generated within developed areas of the site will be managed through a dedicated stormwater drainage network designed in accordance with Sustainable Drainage Systems (SuDS) principles. This system will control runoff and ensure that discharge rates are restricted to greenfield runoff levels, thereby preventing any increase in pluvial flood risk on or off the site.		
Archaeological Sensitivity	There are no known archaeological features mapped within the site.	There are six recorded archaeological monuments located within the proposed wind farm site. A field system (MA123-038; AH79), a Zone of Notification associated with three burnt mounds, a fulacht fia and a redundant record (MA123-067001, MA123-067002, MA123-067003, MA123-067004, MA123-067; AH99), which is crossed by an access track, turning head and hardstand. The closest monument to the development comprises a hill fort (MA123-041001), located 80 m west of Turbine 13.	There are no known archaeological features mapped within the site.	There two recorded archaeological monuments located within the south western cluster of the site. One Enclosure and one ringfort (Cashla).
Feasibility Assessment	Although the site has the potential to accommodate wind turbines. The identified ecological	Although the constraints exercise identified areas of Annex 1 habitat in the Cloughmoyne SAC and a	As per site 1, this site has the potential to accommodate wind turbines, however, to a lesser scale.	Although the site has the potential to have an export capacity of up to 45 MW. Site 4

	constraints including unfavourable ground conditions, significant number of landowners, extensive turbary rights and areas of regenerating peat land. The site would potentially have a greater environmental risk compared to the other sites. As such this site was **not selected** for detailed assessment.	potential hydrological connection to the Lough Corrib SAC, these are located to the west and south of the site and can be avoided by wind farm infrastructure and effects can be mitigated by design. This site was initially thought to have the potential to accommodate up to 14 wind turbines with an export capacity of up to 70 MW. This site was deemed the most suitable for further detailed assessment.	The site was designated as Open to Consideration at the time of screening, and has suitable wind resource. However, due to the smaller scale of the project and the distance to the closest 38 kV point of connection (7.5 km), the project is not financially viable. As such this site was **not selected** for detailed assessment.	is considered to have a number of constraints which would significantly reduce and already small developable area, particularly in the clusters to the south. These include the flood plain and presence of archaeology features. As such this site was **not selected** for detailed assessment.

3.4.3 Alternative Site Layouts/Designs

3.4.3.1 Key Design Drivers

During the development of the EIAR, environmental surveys of the proposed wind farm site, Grid Connection Route (GCR) and works areas on the proposed Turbine Delivery Route (TDR) were carried out to establish the baseline environment. All site constraints were identified and updated as further detailed assessment were undertaken. The location of local and national roads, streams, residential dwellings, landowner boundaries, telecommunication links, ecologically sensitive areas and archaeological sites were mapped in detail. Separation distances to identified constraints were determined using GIS (see Figure 3-5Constraints Map).

The robust and iterative site layout design process considered the size, number and positioning of turbines and layout of associated site infrastructure (i.e. internal access tracks, borrow pit(s), temporary construction compounds, substation, LiDAR, etc.). Alternatives considered for each of these elements are documented in the following sections. An iterative process requiring input from the design team, environmental specialists and the Applicant was followed and where possible, potential environmental effects were reduced or eliminated through changes to the design, and the inclusion of embedded mitigation as part of the overall design. The constraints identified during this process are presented in Figure 3-5.

Constraints and environmental sensitivities were first identified, and buffers applied in order to determine a viable area within the site to accommodate development. The constraints identified and resulting design solutions are listed in Table 3- 3.

Table 3- 3: Environmental Considerations

Environmental Consideration	Required set back / constraint	Design Solutions
Residential Amenity	The existing 2006 WEDGs require a 500 m setback. The revised Draft 2019 WEDGs recommend a mandatory minimum setback of 500 m or a 4 times tip height setback distance (whichever is greatest) is also complied with.	In order to minimise potential effects on residential amenity, a decision was made early in the design process to maintain a minimum set-back of 4 times tip height to the nearest point of curtilage of non-financially involved dwellings in line with the setback requirements in the 2006 WEDGs and Draft Revised 2019 WEDGs. The proposed layout has achieved a high level of separation between dwellings and turbines by providing a minimum separation distance of 600 m to the nearest point of curtilage of non-financially involved dwellings.
Flora and Fauna	Mitigation by avoidance measures to avoid significant potential effects on sensitive species and habitats.	The project avoids European Sites and Nationally designated sites. The potential effects on Flora and Fauna as outlined in Chapter 6 (Biodiversity) shows that the proposed project will

Environmental Consideration	Required set back / constraint	Design Solutions
		have no significant effect on ecological features. The presence of sensitive flora and fauna is limited across much of the proposed wind farm site, with the majority of the wind farm site occupied by agricultural lands. No in-stream works are proposed.
Ornithology	Avoidance of nesting area, foraging sites and migratory routes.	• The assessment presented in Chapter 7 (Ornithology) concluded that the Project would not result in significant effects on bird populations. The Project incorporates standard embedded mitigation measures and good practice measures, together with proportionate post-construction monitoring. These include measures relating to Construction Disturbance Mitigation; • Mitigation of Operational Disturbance; • Mitigation of Displacement effects; and • Post Construction Monitoring These are described further in Chapter 7 (Ornithology).
Soils and Geology	Karst features. Limestone pavement	The proposed wind farm site has no mapped karst features within or directly adjacent to it. The nearest mapped karst feature (sinking stream) is located approximately 325 m southeast of T12. No peat has been mapped as being present within the proposed wind farm site. Agricultural land required for footprint of the proposed infrastructure was minimised through use of existing access tracks where practical. Proposal to use borrow pit for extraction of onsite aggregate, reduced the requirement for the external import of material.

Environmental Consideration	Required set back / constraint	Design Solutions
Hydrology & Hydrogeology	Minimum setback from rivers and streams and appropriate mitigation designed to avoid siltation during construction. Avoid impact on existing drainage regime.	In identifying and avoiding direct effects on drainage features the proposed project has implemented 'avoidance of impact' measures. Example includes the maintenance of a 50 m setback from main infrastructure (turbines, substation, borrow pits, compounds) to EPA mapped watercourses will be maintained.
Noise and Vibration	The 2006 WEDGs states that '*a lower fixed limit of 45dB(A) or a maximum increase of 5dB(A) above background noise at nearby noise sensitive locations is considered appropriate to provide protection to wind energy development neighbours.' Similarly, these guidelines indicate 'A fixed limit of 43dB(A) will protect sleep inside properties during the night.*'	The appropriate noise criteria will be adhered to by the proposed wind farm while in operation, as described in Chapter 12.
Shadow Flicker	Near Zero shadow flicker.	The proposed project has committed to near zero shadow flicker as described in Chapter 10. This is compliant with the 2006 WEDGs and gives due consideration to both emerging best practice and Draft Revised 2019 WEDGs.
Cultural Heritage	Recorded archaeological monuments or architectural sites have been avoided and therefore there will be no direct impact.	The final layout has been designed to ensure that there is no direct impact on recorded archaeological monuments or architectural sites.
Material Assets	No significant effects to any telecommunications networks or aviation in the area.	The final layout has been designed to ensure that there is no significant effects on telecommunications and aviation related activities once mitigation is accounted for.

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9°6'10"W

751500

748000

N

R334

Ramolin

Shrule

Aint-Mor Road

Bunnahallistran

Ballynalty

Ballisnahyny

Cloughmoyne pNHA

Cloughmoyne SAC

T1

T2

T3

T4

T5

T6

T7

T8

T9

Kilroe

Rostaff Turlough pNHA

Lough Corib SAC

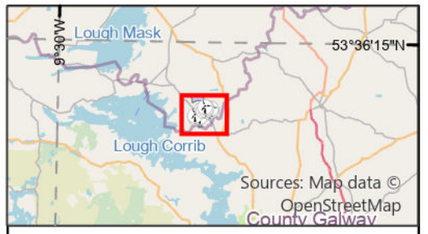
Gortbrack

Mountcurry

Headford Road

R333

Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, Source: Esri, Vantor, Earthstar Geographics, IGN, and the GIS User Community



Legend

- Proposed wind farm site
- Turbines
- 1km Buffer from Site Boundary
- 38kV Gridline
- Regional Roads

Ecology

- Proposed Natural Heritage Areas (pNHA)
- Special Area of Conservation (SAC)

Receptors

- Sensitive
- Non-sensitive
- Derelict
- Planning application

Cultural heritage

- Designated records
- Redundant records
- Field System
- SMR - Zone of notification
- National Inventory of Architectural Heritage (NIAH)
- Hillfort

0 650 1,300

Meters

NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING\
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE\
3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY \ WORK COMMENCES\
4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Rev	Date	Description	By	Chkd.
A	14/10/2026	First issue	S.P	J.S

Client: ROOAUNALAGHTA Green Energy

Project:

Roonaunalaghta, Co. Mayo

Title:

Figure 3-6:
Constraints Map

Scale @ A3: 1:22,000

Prepared by:	Checked by:	Date:
S.Pezzetta	J.Stanton	October 2026

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Map Ref: 11981-006-C.BUFF1KM-RONLA-TOB-A

Draft: A

The proposed project is on a site within existing agricultural fields predominantly, bounded by stone walls, hedgerows and treelines with pockets of scrub and woodlands in the eastern half of the site. The proposed wind farm site is located on either side of the R334 Regional Road. In relation to current land use and operations, when designing the proposed project, the Applicant and the Project Team had objectives to minimise the impact on hedgerows and capitalise on opportunities for biodiversity enhancements; minimise impact on farm operations during construction and operation phases and maximise the use of existing farm tracks. In respect of these objectives, the involved landowners for the proposed project were consulted throughout the design process.

The design of the proposed project and the selection of preferred options for various project elements (i.e., GCR, TDR, access to the wind farm site, etc.) evolved in response to findings from baseline surveys; the construction solutions and mitigation measures recommended from the assessment of likely significant effects of the proposals on the environment; and feedback received from stakeholder engagements including various consultees and planning authorities, as reported in EIAR Chapter 1.

3.4.3.2 Evolution of Design

The design of the proposed project was an iterative process which considered a range of alternative turbine layouts, with plans for site infrastructure and locations for temporary works changing in response to changes in turbine positions. The design iterations were influenced by potential environmental effects which were identified throughout the environmental assessment, with the main aim of avoiding in the first instance or reducing those effects through project design. These alternative turbine layouts are illustrated in Figure 3-6and Table 3- 4.

Table 3- 4: Evolution of proposed project Design

Design Iteration	Description of layout /iteration	Reason for change
Initial Iteration 1	An initial design within the developable area of the wind farm site consisted of fourteen wind turbines shown in Figure 3-6 (orange points). This represented the maximum number of turbines which could be developed at the proposed wind farm site, including all lands with a suitable 600 m setback from dwellings. It was considered with respect to the recommended housing setback buffer set out within the Draft Revised 2019 WEDGs (which exceeds the 2006 WEDGs).	This design iteration initially positioned several turbines within habitats that were subsequently identified as environmentally sensitive resulting in negative effects on biodiversity, prompting a refinement of the layout to avoid these areas. It also included a turbine in lands that no longer form part of the final project as the landowner did not wish to be included in the project.
Design Iteration 2	A revised layout was considered in Design Iteration 2 shown in Figure 3-6 (yellow points). This turbine layout considered that utilisation of two different turbine models, 4 no. V136 with a rotor diameter of 136 m and tip height of 150 m in the area to the South west of the R334 and 6 no. V150 with a rotor diameter of 150 m and a tip height of 175 m in the area to the north east.	Early-stage site visits and wireframe montages indicated that, whilst this relatively open, rolling landscape setting has the capacity to accommodate large-scale turbines, a maximum tip height of approximately 150 m represented the upper envelope of turbine scale that could be visually accommodated within this context without generating a strong sense of overbearing. Initial designs also incorporated two different turbine heights across the two distinct turbine clusters. Assessment of the wireframes indicated that this variation in turbine scale had the potential to generate a degree of visual tension and inconsistency between the two turbine arrays, particularly where they would be viewed in combination. On this basis, it was recommended that the turbine arrays situated on either side of the regional road should adopt a consistent maximum turbine height, thereby establishing a more coherent and visually balanced overall layout. It was also recommended that turbine heights should not exceed the maximum tip height of approximately 150 m represented by the V136 turbine model.
Design Iteration 3	Design Iteration 3 was based on the initial design iteration and is shown in Figure 3-6(green points). Turbines 5, 6 and 7 were repositioned as part of this design iteration.	Turbines 5 and 6 were further adjusted in this design iteration to minimise potential environmental effects such as habitat loss (species rich grassland), in particular in area around T5 where there is species rich grassland and to maximise inter-turbine spacings, thereby increasing potential production.

Design Iteration 4	Design Iteration 4, shown in Figure 3-6(pink points). This design iteration involved a minor adjustment to the position of T7 to further refine the layout.	T7 was repositioned to reduce the extent of hedgerow removal required for bat-related buffers and to minimise potential effects on bat activity within the area.
Design Iteration 5	Design Iteration 5, shown in Figure 3-7, is referred to as the 'final design iteration' and is the one currently proposed. T5 and T6 were subject to minor positional adjustments in this design iteration to further optimise the layout.	T5 and T6 were subject to minor positional adjustments, T5 to reflect updated setback requirements for sensitive receptors in consideration of residential amenity and T6 to increase spacings between turbines to reduce visual effects and improve performance.

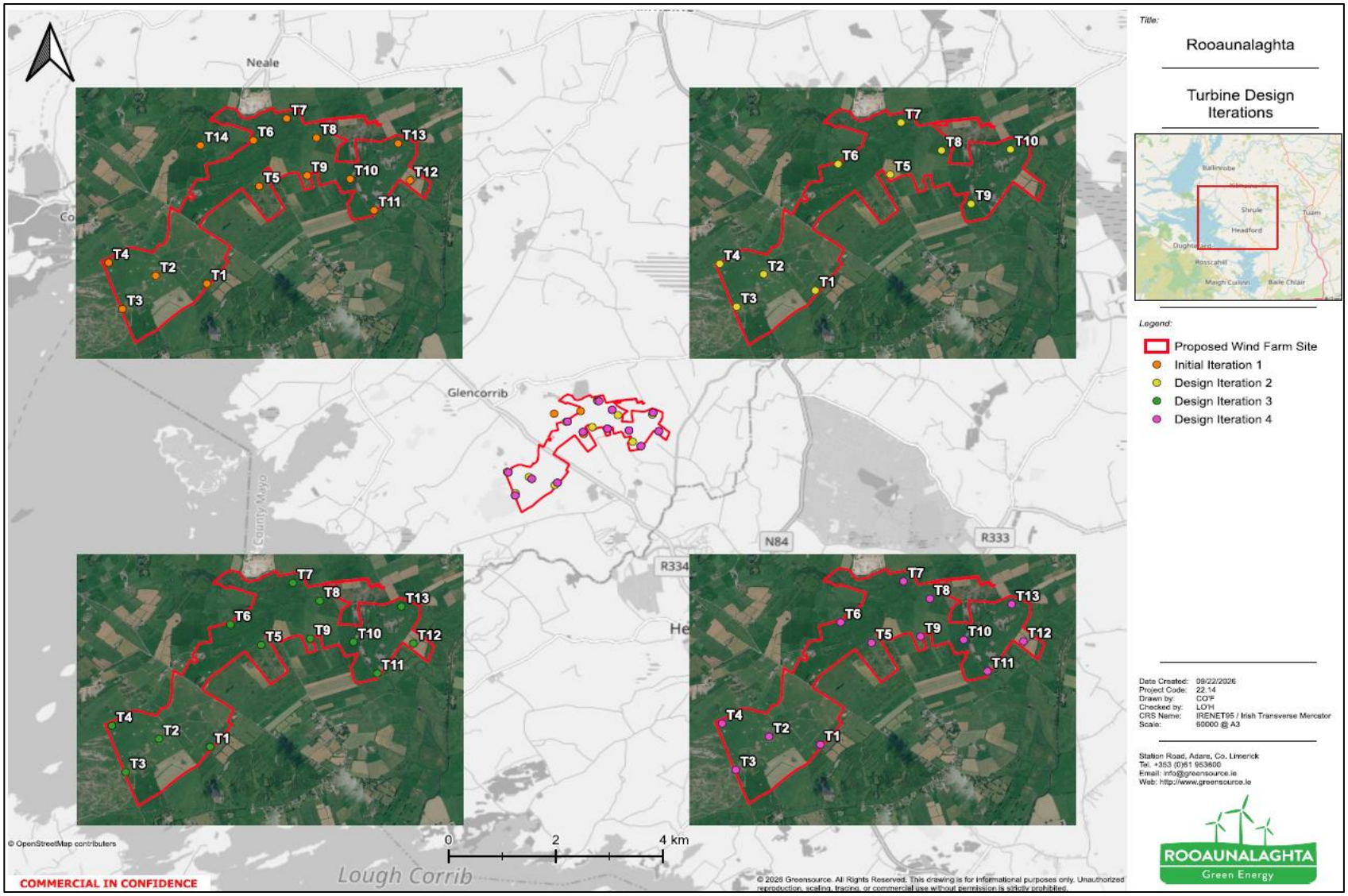


Figure 3-6: Site Layout Design Iterations: Turbine Locations

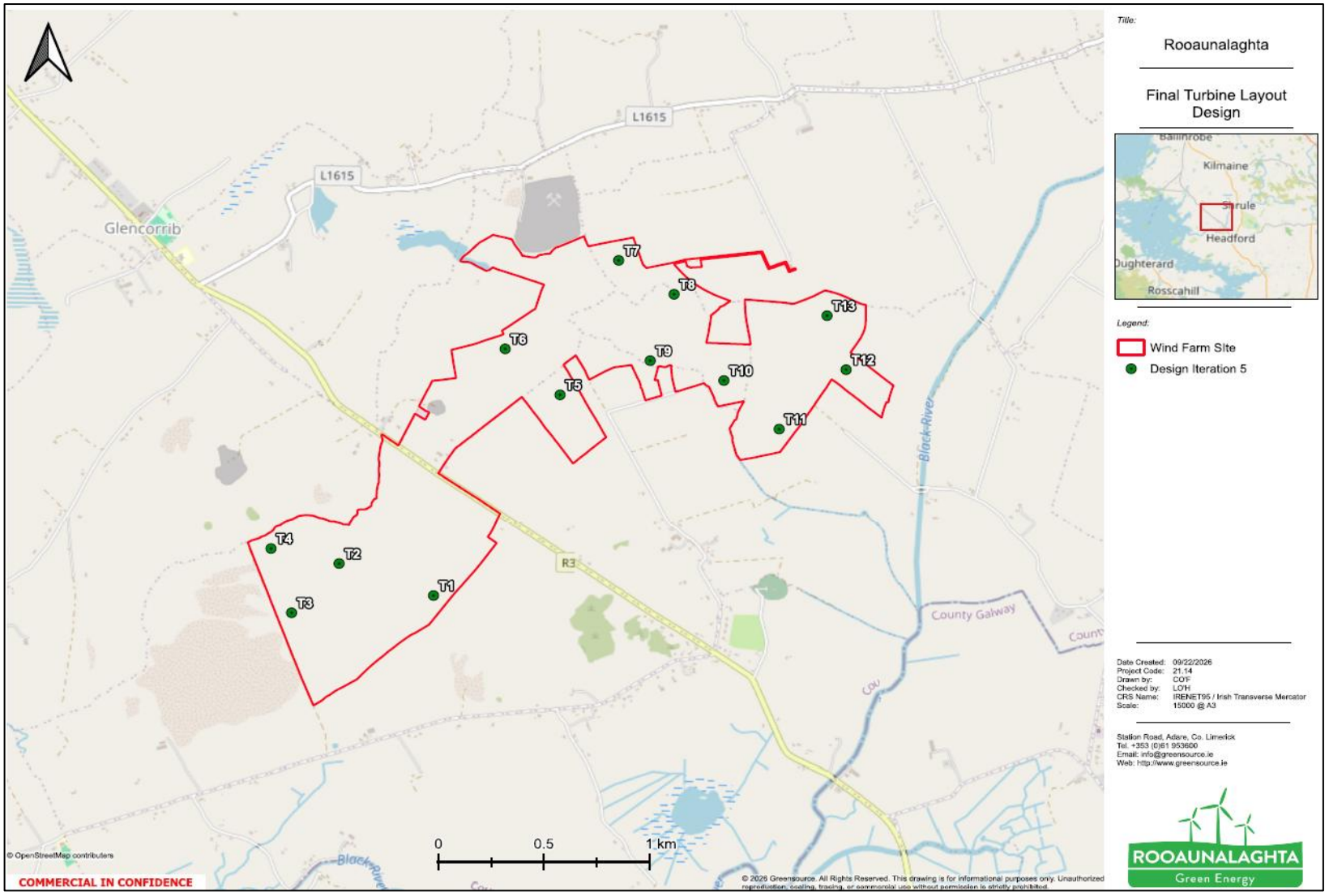


Figure 3-7: Site Layout Design Iteration 5

3.4.3.3 Turbine Layouts

In the layout, turbines were positioned to optimise access track layout and configuration of hardstands and crane pads; and observe the established setbacks and buffers referred to above. Every shift of a turbine had a potential knock-on effect on other turbine positions and had to be checked to ensure appropriate separation distances could be met to maximise wind energy yield. They also had to consider the habitats and other constraints.

The following assessment is based on the turbine layouts previously described. The summary of potential effects is outlined in Table 3- 5.

Table 3- 5: Summary of the potential effects for alternative turbine layouts

Environmental Consideration	Design Iteration 1	Design Iteration 2	Design Iteration 3	Design Iteration 4	Design Iteration 5 (preferred layout)
Human Health and Population	This layout considered lands where the landowner did not wish to participate. This would not have been possible to bring forward as a result. It also included a taller tip height with associated visual amenity effects and reduced setback distance from a small number of sensitive receptors, greater than 500 m but less than 4 times tip height. Overall this results in the greatest potential for significant effects.	This layout included turbines having a slightly reduced spacing from a small number of sensitive receptors. This results in an increased potential for significant effects but not as much as Layout 1.	This layout included turbines having a slightly reduced spacing from a small number of sensitive receptors. This results in an increased potential for significant effects but not as much as Layout 1.	This layout included turbines having a slightly reduced spacing from a small number of sensitive receptors. This results in an increased potential for significant effects but not as much as Layout 1.	This layout was a refinement of DI4 and has a single sensitive receptor within 4 times tip height but greater than 500 m and this sensitive receptor is an involved landowner. This is the most preferable layout in terms of potential for significant effects.
Biodiversity	This layout includes the loss of sensitive habitat (limestone pavement). This results in the greatest potential for significant effects.	This layout includes the loss of sensitive habitat (species rich grassland). This results in an increased potential for significant effects but not as much as Layout 1.	This layout includes the loss of sensitive habitat (hedgerows) and associated impacts for bats. This results in an increased potential for significant effects but not as much as Layout 1 or 2.	This layout includes the loss of sensitive habitat (species rich grassland). This results in an increased potential for significant effects but not as much as Layout 1, 2 or 3.	This layout was a refinement of DI4 and resulted in a reduction of the loss of sensitive habitat (species rich grassland). This is the most preferable layout in terms of potential for significant effects.
Ornithology	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases
Land, Soils and Geology	This layout included potential works overlaying limestone pavement. This results in an increased potential for significant effects.	This layout included potential works overlaying limestone pavement. This results in an increased potential for significant effects.	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases
Hydrology and Hydrogeology	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases
Shadow Flicker	This layout had a larger rotor diameter for some turbines, causing an increase in potential shadow flicker. This results in an increased potential for significant effects.	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases
Material Assets	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases
Air Quality	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases
Climate	The larger rotor diameters would have increased renewable energy generation. This also considers the less suitable turbine spacing and the associated reduced renewable energy generation. This results in a decreased potential for significant effects.	This layout had less suitable turbine spacing with associated reduced renewable energy generation. This results in a slightly increased potential for significant effects.	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases
Noise and Vibration	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases

Cultural Heritage	There is a potential for indirect significant adverse effects for construction/operational/decommissioning phases due to the proximity to a Hill fort.	There is a potential for indirect significant adverse effects for construction/operational/decommissioning phases due to the proximity to a Hill fort.	There is a potential for indirect significant adverse effects for construction/operational/decommissioning phases due to the proximity to a Hill fort.	There is a potential for indirect significant adverse effects for construction/operational/decommissioning phases due to the proximity to a Hill fort.	There is a potential for indirect significant adverse effects for construction/operational/decommissioning phases due to the proximity to a Hill fort.
Landscape and Visual Impact	This layout included two sizes of turbines. This results in the greatest potential for significant effects.	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases
Traffic	The longer turbine blade would need to be transported to the proposed wind farm site, as would the slightly increased volume of materials needed. This results in the greatest potential for significant effects.	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases

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Design Iteration 5 was chosen as the final layout as it is the most appropriate for the site constraints and has the least likely significant effects, particularly on habitats and setback from sensitive receptors. The layout achieves the objectives as set out in section 3.3.2 and considers all site constraints and the distances to be maintained between turbines and features such as roads and sensitive receptors, while maximising the wind energy potential of the Site. The turbine layout selected has the most suitable project footprint and achieves the optimum output at a more consistent level than would be achievable using different turbine layouts. The final layout maximises project performance, inclusive of potential curtailment measures for Noise (see chapter 12), shadow flicker (See Chapter 10), Biodiversity (see Chapter 6) and Ornithology (see Chapter 7).

3.4.3.4 Windtake 2006 Guidelines

The 2006 Guidelines, Section 5.13 Windtake states that "*The question of windtake should be dealt with at scoping stage and/or during pre-application discussions, to ensure that any proposed layout of wind turbines takes into account the development potential of an adjoining site for a similar development. In general, to ensure optimal performance and to account for turbulence and wake effects, the minimum distances between wind turbines will generally be three times the rotor diameter (=3d) in the crosswind direction and seven times the rotor diameter (=7d) in the prevailing downwind direction. Bearing in mind the requirements for optimal performance, a distance of not less than two rotor blades from adjoining property boundaries will generally be acceptable, unless by written agreement of adjoining landowners to a lesser distance. However, where permission for wind energy development has been granted on an adjacent site, the principle of the minimum separation distances between turbines in crosswind and downwind directions indicated above should be respected.*"

The final design iteration, DI5, has taken "Windtake" into consideration, from an adjoining property developable area and an internal turbine spacing perspective;

The layout has been designed in conjunction with third party specialist design consultants and a wind turbine manufacturer and is based on accurate wind data collected onsite utilising a LiDAR wind monitoring campaign. The results of analysis show that the turbines can operate with some losses due to wake effects, which would be typical of a project of this scale but that the effect will be lessened due to the relatively flat topography of the site. The turbine manufacturer has not raised any concerns in relation to the proposed turbines operational performance on the Rooaunalaghta project. The internal wake effect refers to the aerodynamic interaction between wind turbines within a wind farm, whereby turbines operating in the lee of upwind machines experience reduced wind speeds and increased turbulence as a result of energy extracted from the passing airflow.

It should be noted that wind turbine design has evolved significantly since 2006 and while the DI5 layout does not conform to Section 5.13 for spacing between turbines, "*minimum distances between wind turbines will generally be three times the rotor diameter (=3d) in the crosswind direction and seven times the rotor diameter (=7d) in the prevailing downwind direction"* this is a "general" recommendation and there are a significant amount of projects in operation with more optimised layout configurations, in Ireland and across Europe. The configuration of the proposed turbines achieves a suitable balance between optimising energy capture and ensuring compliance with required setback distances from sensitive receptors.

The "Developable Area" allows for a 600 m sensitive receptor setback (see Figure 3-6 (yellow points). The site development footprint has been maximised and narrow landholding plots adjacent to the site, located within the 600 m sensitive receptor setback, would not be able to achieve a distance of two rotor blades from adjoining property boundaries, therefore, they are not viable for wind energy development. Other landholdings with potential development opportunities within the developable area were approached and declined to be involved.

3.4.3.5 Internal Access Track Design

Internal access tracks are required to enable transport of turbine components and construction materials to each of the turbine locations. Internal access tracks must be of a gradient and width sufficient to allow safe movement of equipment and vehicles, especially at junctions. Alternative access track layouts were considered in tandem with the changes to the proposed turbine and infrastructure layout and following examination of options for access to the proposed wind farm site, as the design evolved. As turbine locations were assessed and finalised, the most suitable routes between turbine locations were identified, considering the physical constraints of the proposed wind farm site and utilising the most direct route between turbines to minimise the footprint of the proposed infrastructure, and to avoid hedgerow loss where possible. Site access tracks were also designed with consideration of onsite environmental constraints such as watercourses, hedgerows, stone walls and any associated buffer zones, local topography and the ability for large turbine components delivery. Some of the previously considered site access track layouts are shown in Figure 3-8however these do not suit the currently proposed turbine layout and so were no longer considered. The access track layout was carefully thought through with input from the wider EIAR team, particularly the ecology and hydrology/geology specialists. Where hedgerow and stone wall loss was unavoidable through design, this has been kept to a minimum by "punching through" gaps and widening existing openings.

The aim of the access track design was to utilise the configuration of existing farm tracks as far as possible. Some existing farm tracks are to be upgraded to provide the width and strength required for the transport of turbine components and passage of heavy goods vehicles across the proposed wind farm site during construction phase. The main aim for track upgrades was to ensure minimal disruption to farming operations while at the same time minimising material use and loss of habitats. The alternative to upgrading some sections of existing farm access track was to construct all new access tracks. This would have an increased use of raw materials and require additional habitat loss, resulting in a greater potential effect in terms of ecology (habitat loss), material assets (stone use), air quality (dust associated with additional vehicle movements) and noise (also from the additional vehicle movements) compared to the currently proposed layout.

The proposed site access tracks now include a dedicated track linking the proposed wind farm access tracks to the adjacent operating quarry on the northern side of the proposed wind farm site. This connection enables straightforward access to a potential source of construction material, offering a practical and locally available supply. The alternative to including this additional access track would be to not include it. In the event that this adjacent quarry is not used, then that temporary access track will not be constructed. This is assessed in Table 3- 6.

9°9'48"W

53°29'52"N

525000

N

T1 T2 T3 T4 T5 T6 T7 T8 T9 T10 T11 T12 T13

R334

Kilroe



Legend

- Proposed wind farm site
- Turbine Locations
- Alternative site access track
- Proposed site access track

0 250 500
Meters

Spatial Reference
Datum: IRENET95
EPSG: 2157

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A	14/10/2026	First issue	K.K	J.S

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Rooaunalaghta Green Energy Project

Title:

Figure 3-9:
Alternative Site Access Tracks

Scale @ A3: 1:10,000

Prepared by:	Checked by:	Date:
K.Kale	J.Staunton	October 2026

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Map Ref: 11981-032-Access-S.LAY-TOB-A_option_2

Draft: A

Table 3- 6: Table of potential environmental effects for proposed site access tracks

Environmental Considerations	Option A – not including the temporary direct quarry link road	Option B – including the temporary direct quarry link road (preferred)
Human Health and Population	This would require more traffic to utilise the public road network, resulting in an increased level of noise, dust and emissions with an increased accident risk on the public road compared to a direct private access track. These would all contribute to a local residential amenity reduction. This results in an increased potential for significant effects in construction. No likely significant adverse effects for operational/decommissioning phases	This would reduce traffic volumes on the public road network, resulting in a decreased level of noise, dust and emissions with a decreased accident risk on the public road. These would all contribute to a reduced impact on local residential amenity compared to the option of excluding the direct access track. This results in a lower potential for significant effects in construction. No likely significant adverse effects for operational/decommissioning phases
Biodiversity	There would be a slightly reduced environmental footprint for the proposed works as traffic would use the existing public road network. This results in a slightly decreased potential for significant effects. No likely significant adverse effects for operational/decommissioning phases	There would be a slightly increased environmental footprint for the proposed works. This results in a slightly increased potential for significant effects. No likely significant adverse effects for operational/decommissioning phases
Ornithology	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases
Land, Soils and Geology	There would be a slightly reduced footprint for the proposed works as traffic would use the existing public road network. This would reduce the need for stone slightly, but the road will be removed at the end of the construction phase and the stone will be used to reinstate the borrow pit. This results in a slightly decreased potential for significant effects in construction. No likely significant adverse effects for operational/decommissioning phases	There would be a slightly increased environmental footprint for the proposed works. This would increase the need for stone slightly, but the road will be removed at the end of the construction phase and the stone will be used to reinstate the borrow pit. This results in a slightly increased potential for significant effects in construction. No likely significant adverse effects for operational/decommissioning phases
Hydrology and Hydrogeology	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases
Climate	This would require a longer driving distance resulting in a slight increase in vehicle emissions. This results in a slightly increased potential for significant effects in construction. No likely significant adverse effects for operational/decommissioning phases	This would result in a shorter driving distance resulting in a slight decrease in vehicle emissions. This results in a slightly decreased potential for significant effects in construction. No likely significant adverse effects for operational/decommissioning phases
Air Quality	This would require an increase in dust and fume emissions along local roads. This results in an increased potential for significant effects in construction. No likely significant adverse effects for operational/decommissioning phases.	This would result in a decrease in dust and fume emissions along local roads. This results in a decreased potential for significant effects in construction. No likely significant adverse effects for operational/decommissioning phases.
Landscape & Visual	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases

Material Assets	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases
Noise and Vibration	This would require an increase in noise and vibration along local roads. This results in an increased potential for significant effects during construction. No likely significant adverse effects for operational/decommissioning phases.	This would result in a decrease in noise and vibration along local roads. This results in a decreased potential for significant effects during construction. No likely significant adverse effects for operational/decommissioning phases.
Archaeology and Cultural Heritage	There would be a slightly reduced footprint for the proposed works as traffic would use the existing public road network. This results in a decreased potential for significant effects. No likely significant adverse effects for operational/decommissioning phases.	There would be a slightly larger footprint for the proposed works. This results in an increased potential for significant effects. No likely significant adverse effects for operational/decommissioning phases.
Traffic and Transportation	This would require an increase in traffic movements along nearby roads with an associated increased risk of an accident involving the public. This results in an increased potential for significant effects during construction. No likely significant adverse effects for operational/decommissioning phases.	This would result in a decrease in traffic movements along nearby roads with an associated decreased risk of an accident involving the public. This results in a decreased potential for significant effects during construction. No likely significant adverse effects for operational/decommissioning phases.

Constructing the direct link access track to the adjacent existing quarry would significantly reduce the volume of heavy-vehicle movements required to transport materials from other (more distant) locations, thereby lowering associated traffic levels, noise, and general disruption in the surrounding area. The alternative of not including the direct quarry link access track would result in a greater potential effect in terms of traffic, dust and noise where trucks deliver the material via the existing public road network. Therefore, the option of proceeding with the inclusion of a direct quarry link access track was chosen for the final proposed project.

3.4.3.6 Location of Ancillary Infrastructure and Temporary Works

The ancillary structures required for the proposed project include the site entrances, temporary construction compounds and areas for the temporary storage of excavated material, an on-site control building, and a permanent LiDAR.

The examination of alternatives for site entrances and the selection of the preferred site access arrangement for the construction and operation phases is discussed in detail in section 3.4.3.9.

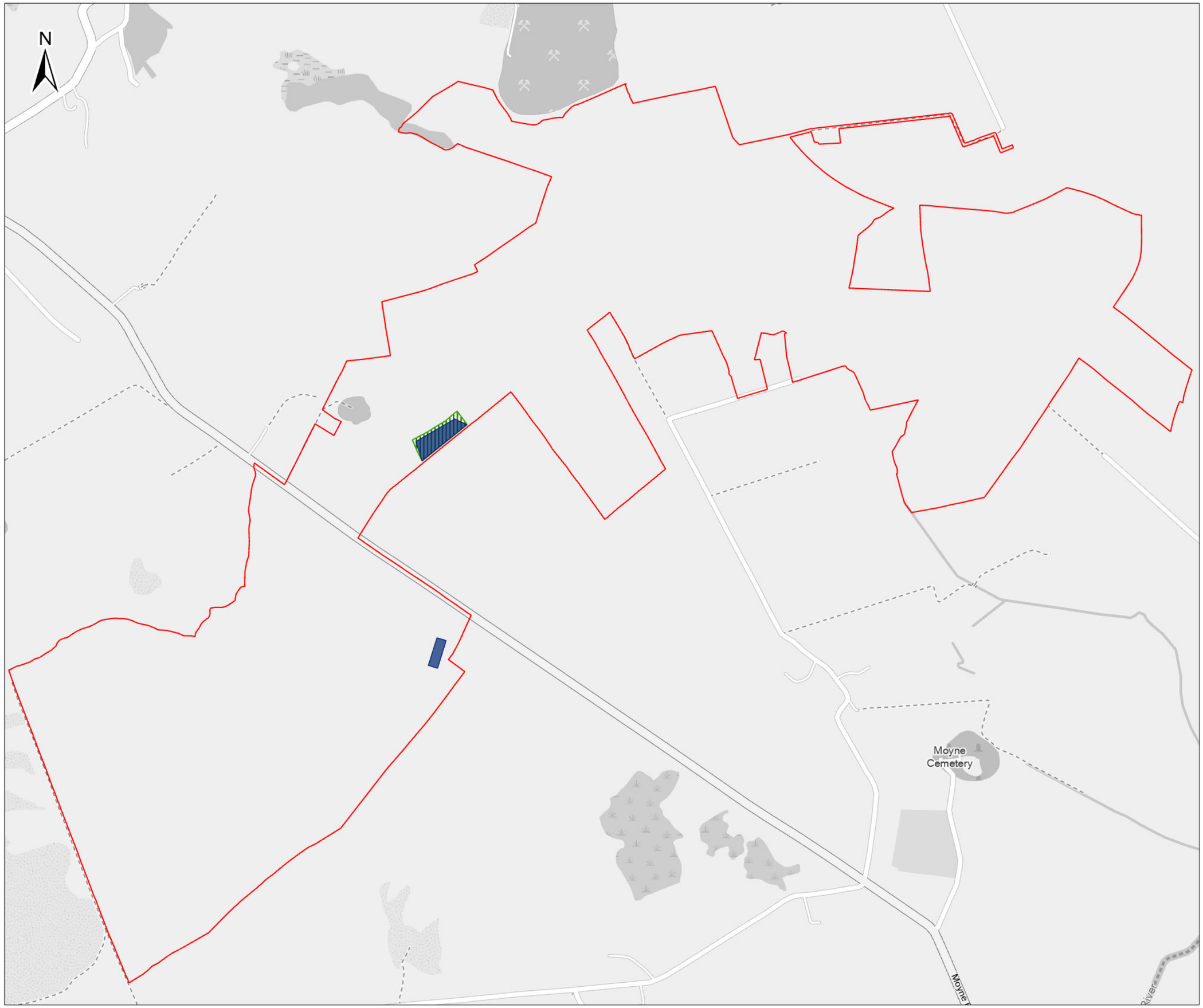
The location and configuration of the temporary construction compounds was selected based on the final track layout, in a location central to the proposed wind farm site, and only after consultation with the Protect Team and the landowners to ensure minimal disruption to farming operations during the construction phase. Following a detailed engineering assessment of the earth materials required to be excavated from the proposed wind farm site, and the earth materials to be brought to site to construct the infrastructure, including consideration of phasing, the amount, configuration and location of designated areas for the temporary storage of earth materials was determined. Again, landowners were consulted to ensure minimal disruption to farm operations during the construction phase.

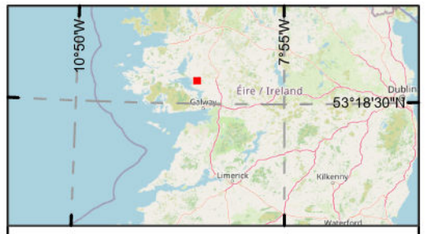
The project team evaluated two potential locations for the control building. The first option, with the control building positioned near T13, was discounted because it would have required additional cable routing to connect at the public road network, resulting in greater construction complexity with associated greater potential for environmental effects and slightly increased Cultural Heritage potential effects, as it was located closer to a recorded monument (Hillfort in the townland of Kinlough - MA123-041001). The selected location, situated between (east of) T7 and T8, is closer to the site exit and therefore offers a more efficient, lower-impact connection to external infrastructure.

3.4.3.6.1 Temporary Construction Compound

At the commencement of the construction phase, two temporary compound areas will be constructed (one to the north and one to the south of the R334) to provide office space, welfare facilities, car parking and hardstands for storing materials. The proposed compounds are shown on Figure 2-1 (see Chapter 2). The topsoil will be stripped where construction of the temporary compound is proposed. At the end of the construction phase, the compound will be reinstated with topsoil and grass seed.

An alternative location and dimensions for the temporary construction compound were considered during the design iterations (see Figure 3-9). The initial location considered a single larger compound on the northern side of the R334.





Legend

- Proposed wind farm site
- Proposed Construction Compounds
- Alternative Temporary Construction Compound

0 250 500
Meters

Spatial Reference
Datum: IRENET95
EPSG: 2157

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Figure 3-10:
Alternative Temporary Construction Compound Considered

Scale @ A3: 1:9,100

Prepared by:	Checked by:	Date:
K.Kale	J.Staunton	October 2026

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Map Ref: 11981-043-COMP-S.BO-TOB-A

Draft: A

An assessment of an alternative temporary construction compound is provided in Table 3- 7.

Table 3- 7: Table of potential environmental effects for proposed temporary construction compound

Environmental Considerations	Option A – Single larger compound to the north of the R334	Option B – Two smaller compounds with one each side of R334 (preferred)
Human Health and Population	This would require additional traffic movements crossing the R334, resulting in an increased safety risk, as well as the potential noise and dust associated with the additional movements. This results in an increased potential for significant effects for the construction phase. No likely significant adverse effects for operational /decommissioning phases.	This would result in reduced traffic movements crossing the R334, therefore reducing the safety risk, as well as the potential noise and dust associated with the additional movements. This results in a decreased potential for significant effects for the construction phase. No likely significant adverse effects for operational /decommissioning phases.
Biodiversity	Total footprint would be similar, in a similar habitat, albeit in one large area. No likely significant adverse effects for construction/ operational/decommissioning phases.	Total footprint would be similar, in a similar habitat, albeit in two smaller areas. No likely significant adverse effects for construction/ operational/decommissioning phases.
Ornithology	No likely significant adverse effects for construction/operational/decommissioning phases.	No likely significant adverse effects for construction/operational/decommissioning phases.
Land, Soils and Geology	Total footprint would be similar, albeit in one large area. No likely significant adverse effects for construction/ operational/decommissioning phases.	Total footprint would be similar, albeit in two smaller areas. No likely significant adverse effects for construction/ operational/decommissioning phases.
Hydrology and Hydrogeology	No likely significant adverse effects for construction/operational/decommissioning phases.	No likely significant adverse effects for construction/operational/decommissioning phases.
Climate	No likely significant adverse effects for construction/operational/decommissioning phases.	No likely significant adverse effects for construction/operational/decommissioning phases.
Air Quality	The additional traffic movements crossing the R334 may have resulted in additional dust deposition and emissions. This results in an increased potential for significant effects for the construction phase. No likely significant adverse effects for operational /decommissioning phases.	The lower traffic movements crossing the R334 result in reduced dust deposition and emissions. This results in a decreased potential for significant effects for the construction phase. No likely significant adverse effects for operational /decommissioning phases.
Landscape & Visual	No likely significant adverse effects for construction/operational/decommissioning phases.	No likely significant adverse effects for construction/operational/decommissioning phases.
Material Assets	No likely significant adverse effects for construction/operational/decommissioning phases.	No likely significant adverse effects for construction/operational/decommissioning phases.
Noise and Vibration	The additional traffic movements crossing the R334 may have resulted in additional noise emissions. This results in an increased potential for significant effects for the construction phase. No likely significant adverse effects for operational /decommissioning phases.	The lower traffic movements crossing the R334 result in reduced noise emissions. This results in a decreased potential for significant effects for the construction phase. No likely significant adverse effects for operational /decommissioning phases.

Archaeology and Cultural Heritage	Total footprint would be similar, albeit in one large area. No likely significant adverse effects for construction/ operational/decommissioning phases.	Total footprint would be similar, albeit in two smaller areas. No likely significant adverse effects for construction/ operational/decommissioning phases.
Traffic and Transportation	This would require additional traffic movements crossing the R334, resulting in an increased safety risk. This results in an increased potential for significant effects for the construction phase. No likely significant adverse effects for operational /decommissioning phases.	This would result in fewer traffic movements crossing the R334, with a decreased safety risk. This results in a decreased potential for significant effects for the construction phase. No likely significant adverse effects for operational /decommissioning phases.

Option A in Table 3- 7was discounted as it would require significantly more traffic movements as all workers, materials etc. for the wind turbines to the south of the R334 would need to travel to the temporary northern compound first and then south across the R334, resulting in more traffic movements on the public road, with great associated risks. The total footprint would have been the same so that was not a deciding factor.

3.4.3.6.2 Borrow Pit Locations

The use of an onsite borrow pit represents an efficient use of existing onsite resources and would also significantly reduce the need to transport large volumes of construction materials along the surrounding public road network to the proposed wind farm site. One alternative potential borrow pit location was identified during the development of the site layout (see Figure 3-10). An assessment of this and the currently proposed location was carried out having regard to existing site constraints (habitat value, topography, proximity to the proposed internal road network etc.).

An assessment of an alternative borrow pit location relative to the proposed borrow pit is provided in Table 3-8

9°9'48"W

53°29'52"N

525000

N

T1
T2
T3
T4
T5
T6
T7
T8
T9
T10
T11
T12
T13

R334
R334
R334

Kilroe



Legend

- Proposed wind farm site
- Turbine Locations
- Proposed Borrow Pit
- Alternative Borrow Pit

0 250 500
Meters

Spatial Reference
Datum: IRENET95
EPSG: 2157

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Rooaunalaghta Green Energy Project

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Figure 3-11:
Alternative Borrow Pit Location

Scale @ A3: 1:10,000

Prepared by:	Checked by:	Date:
K.Kale	J.Staunton	October 2026

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Map Ref: 11981-030-B.Pits-S.BO-TOB-A

Draft: A

Table 3- 8: Table of potential environmental effects for proposed borrow pit location

Environmental Considerations	Option A – South of T6	Option B – Southwest of T7 (preferred)
Human Health and Population	This was located in an area that is further from the existing adjacent quarry and nearer to sensitive receptors, therefore may be perceived as a greater impact to residential amenity in the houses along the R334. This results in a slightly increased potential for significant effects for the construction phase. No likely significant adverse effects for operational /decommissioning phases.	This was located in an area that is closer to the existing adjacent quarry and further from sensitive receptors, therefore may be perceived as a lesser impact to residential amenity in the houses along the R334. This results in a slightly decreased potential for significant effects for the construction phase. No likely significant adverse effects for operational /decommissioning phases.
Biodiversity	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases
Ornithology	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases
Land, Soils and Geology	Less certainty on the underlying geology as it is further from the existing quarry. No likely significant adverse effects for construction/operational/decommissioning phases	More certainty on the underlying geology as it is closer to the existing quarry. No likely significant adverse effects for construction/operational/decommissioning phases
Hydrology and Hydrogeology	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases
Climate	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases
Air Quality	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases
Landscape & Visual	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases
Material Assets	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases
Noise and Vibration	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases
Archaeology and Cultural Heritage	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases
Traffic and Transportation	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases

The alternative option, situated between T5 and T6, was ultimately discounted because the available space was more constrained and the area is closer to environmental sensitivities (i.e. nearer to sensitive residential receptors and further from the existing quarry). The second option, now selected, is positioned beside an existing quarry, providing greater confidence in the quality and consistency of the rock material and aligning more naturally with the established

noise levels and ongoing activity already characteristic of the surrounding environment. It is also further removed from sensitive receptors.

3.4.3.6.3 Operational phase Lidar

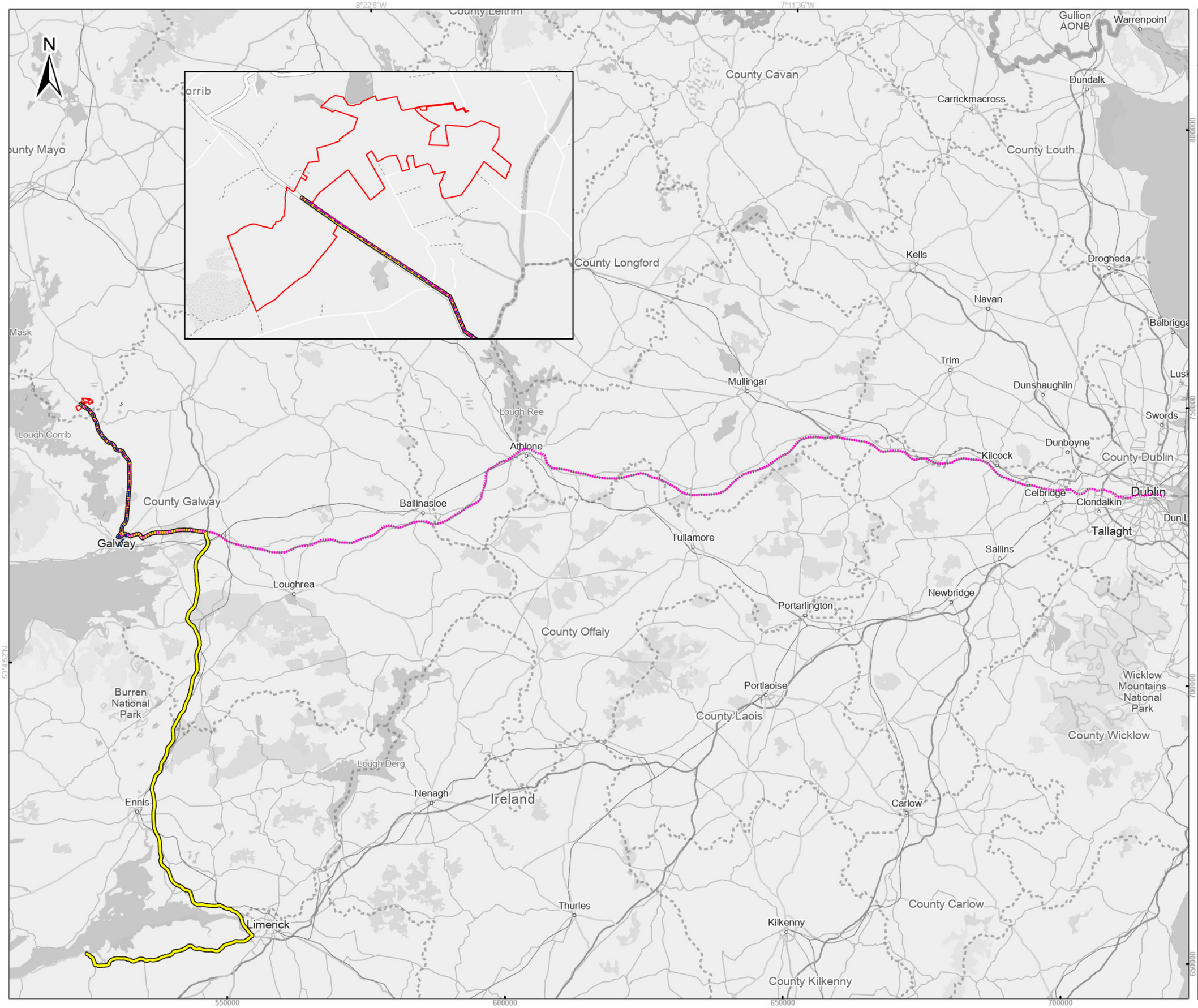
An operation phase lidar unit will be used to monitor wind speeds in the area during the proposed project operational phase. An alternative location was considered for this Lidar unit. This alternative location was beside the proposed onsite control building. There was no environmental reason to choose one location over the other with the unit (and associated works) being small, but ultimately it was found that the proposed location would be most representative of the overall site for wind and it was chosen for that reason.

3.4.3.7 Port of entry

The port of entry chosen for turbine delivery to the proposed wind farm site is Galway Port, which, in comparison to other alternative ports, minimises the distance and therefore the associated traffic and air quality effects arising from the delivery vehicles. Killybegs Harbour was briefly considered as an alternative port of entry; however, it was not progressed for detailed assessment due to its comparatively less favourable transport logistics, including a significantly longer haulage route, travel through multiple counties and numerous route constraints and pinch points that would present challenges for the manoeuvring of abnormal loads. A number of reasonable alternatives were subsequently assessed in greater detail

as part of this EIAR, including Dublin and Foynes Ports.

The alternative Ports of entry and the associated TDR relative to the proposed port and TDR is provided in Table 3- 9 and shown in Figure 3-11.





Legend

- Proposed wind farm site
- Proposed Turbine Delivery Route
- Alternative TDR: Dublin Docklands
- Alternative TDR: Foynes

0 10 20
Kilometers

Spatial Reference
Datum: IRENET95
EPSG: 2157

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Figure 3-12:
Alternative TDRs - Ports of Entry

Scale @ A3: 1:625,000

Prepared by:	Checked by:	Date:
K.Kale	J.Staunton	October 2026

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Map Ref: 11981-042-TDR-Alt.-TOB-A

Draft: A

Table 3- 9: Table of potential environmental effects relative to proposed port of entry (with associated delivery route)

Environmental Considerations	Option A – Route from Dublin Port	Option B – Route from Foynes Port	Option C – Route from Galway Port
Human Health and Population	Significantly longer route which would require slightly more enabling works (widening of the road, removal/ movement of street furniture, etc. at pinch points on very busy roads around Dublin and at motorway interchanges) to get to site, resulting in a greater impact to road users and residents along the route. This option would be anticipated to have a similar impact as Alternative B, but greater than the proposed option. This results in a slightly increased potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.	Longer route which would require more enabling works (widening of the road, removal/ movement of street furniture, etc. at pinch points on near Foynes, on the N69 and at motorway interchanges) to get to site, resulting in a greater impact to road users and residents along the route. This option would be anticipated to have a similar impact as Alternative A, but slightly greater than the proposed option. This results in a slightly increased potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.	Shortest route which would require less enabling works to get to site, resulting in the lowest impact to road users and residents along the route. This option would be anticipated to have the lowest impact. This results in a lower potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.
Biodiversity	Significantly longer route which would require slightly more enabling works at pinch points, however much of the route is on motorways and most works are in areas that are already built ground or heavily modified. This option, would be anticipated to have a slightly less impact than Alternative B, but greater than the proposed option. This results in a slightly increased potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.	This is a longer route which would require more enabling works at pinch points, resulting in a greater potential impact to biodiversity along the route than the proposed option, particularly along the N69. This option would be anticipated to have the greatest impact of any option. This results in a slightly increased potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.	Shortest route which would require less enabling works to get to site, resulting in the lowest potential impact to biodiversity along the route. This option would be anticipated to have the lowest impact of any option. This results in a lower potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.
Land, Soils and Geology	Significantly longer route which would require slightly more enabling works at pinch points, resulting in a greater potential impact to land, soils and geology (mostly through soil disturbance) along the route than the proposed option. This option would be anticipated to have a similar impact as Alternative B, but greater than the proposed option. This results in a slightly increased potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.	Longer route which would require more enabling works at pinch points, resulting in a greater potential impact to land, soils and geology (mostly through soil disturbance) along the route than the proposed option. This option would be anticipated to have a similar impact as Alternative A, but slightly greater than the proposed option. This results in a slightly increased potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.	Shortest route which would require less enabling works to get to site, resulting in the lowest potential impact to land, soils and geology (mostly through soil disturbance) along the route. This option would be anticipated to have the lowest impact of any option. This results in a lower potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.

Hydrology and Hydrogeology	Significantly longer route which would require slightly more enabling works at pinch points, resulting in a greater potential impact to surface and ground water quality along the route than the proposed option (in general through greater land take and soil disturbance). This option would be anticipated to have a similar impact as Alternative B, but greater than the proposed option. This results in a slightly increased potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.	Longer route which would require more enabling works at pinch points, resulting in a greater potential impact to surface and ground water quality along the route than the proposed option (in general through greater land take and soil disturbance). This option would be anticipated to have a similar impact as Alternative A, but slightly greater than the proposed option. This results in a slightly increased potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.	Shortest route which would require less enabling works to get to site, resulting in the lowest potential impact to surface and ground water quality along the route. This option would be anticipated to have the lowest impact of any option. This results in a lower potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.
Climate and Air Quality	Significantly longer haul route leading to slightly greater potential for emissions both from works and from the longer haulage. This option would be anticipated to have the greatest impact of any option. This results in a slightly increased potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.	Longer haul route leading to greater potential for emissions both from works and from the longer haulage. This option, would be anticipated to have a slightly less impact than Alternative A, but greater than the proposed option. This results in a slightly increased potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.	Shortest route leading to lowest potential for emissions both from fewer works and from the shorter haulage. This option would be anticipated to have the lowest impact of any option. This results in a lower potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.
Landscape & Visual	The additional accommodation works required along the longer route may have a greater potential visual impact, however this would be temporary and very localised in nature in areas that are already heavily modified, so would not be significant. This option would be anticipated to have a similar impact as Alternative B, but greater than the proposed option. This results in a slightly increased potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.	The additional accommodation works required along the longer route may have a greater potential visual impact, however this would be temporary and very localised in nature, so would not be significant. This option would be anticipated to have a similar impact as Alternative A, but slightly greater than the proposed option. This results in a slightly increased potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.	The least amount of accommodation works required along the shortest route may have a lower potential visual impact. This option would be anticipated to have the lowest impact of any option. This results in a lower potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.
Noise and Vibration	Significantly longer route which would require slightly more enabling works at pinch points. However the works would be in an industrial area near Dublin. Overall, this option, would be anticipated to have less impact than Alternative B, but greater than the proposed option. This results in a slightly increased potential for significant effects for construction phase.	Longer route which would require more enabling works at pinch points, resulting in a greater potential impact from a noise and vibration perspective along the route than the proposed option. This option would be anticipated to have the greatest impact of any option. This results in a slightly increased potential for significant effects for	Shortest route which would require less enabling works to get to site, resulting in the lowest impact to sensitive receptors in terms of noise and vibration along the route. This option would be anticipated to have the lowest impact. This results in a lower potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.

	No likely significant adverse effects for operational/decommissioning phases.	construction phase. No likely significant adverse effects for operational/decommissioning phases.	
Cultural Heritage	Significantly longer route however any additional works required would be in previously disturbed ground near Dublin. This option would be anticipated to have a similar impact as Alternative B, but greater than the proposed option. for construction phase. No likely significant adverse effects for operational/decommissioning phases.	Longer route which would require more enabling works at pinch points, resulting in a greater potential impact to archaeology and cultural heritage along the route (particularly if works are required on the N69) than the proposed option (due to greater land take). This option would be anticipated to have a similar impact as Alternative A, but slightly greater than the proposed option. for construction phase. No likely significant adverse effects for operational/decommissioning phases.	Shortest route which would require less enabling works to get to site, resulting in the lowest potential impact to archaeology and cultural heritage along the route. This option would be anticipated to have the lowest impact of any option. This results in a lower potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.
Traffic and Transportation	Significantly longer route which would require more enabling works (widening of the road, removal/ movement of street furniture, etc. at pinch points on very busy roads around Dublin and at motorway interchanges) to get to site, along with a longer slow moving convoy on the motorway resulting in a greater potential impact to road users along the route. This option would be anticipated to have the greatest impact of any option. for construction phase. No likely significant adverse effects for operational/decommissioning phases.	Longer route which would require more enabling works (widening of the road, removal/ movement of street furniture, etc. at pinch points on very busy roads near Foynes, on the N69 and at motorway interchanges) to get to site, along with a longer slow moving convoy on the motorway resulting in a greater potential impact to road users along the route. This option, would be anticipated to have a slightly less impact than Alternative A, but greater than the proposed option. for construction phase. No likely significant adverse effects for operational/decommissioning phases.	Shortest route which would require less enabling works to get to site, resulting in the lowest potential impact to road users along the route. This option would be anticipated to have the lowest impact of any option. This results in a lower potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.

The selection of these two alternative ports is less favourable due to some challenging pinch points and the added length of the delivery routes to the proposed wind farm site. It was found that the use of Dublin Port may require works at the very busy M50/M7 interchange, and due to the effects, this (both preparation works and the slow moving transport) would have on existing traffic flows at such a busy location, this was viewed as the least preferred option. Both of these alternative options (Dublin Port and Foynes Port) would involve a longer transport route along busy road networks with more enabling works required, and therefore resulting in increased traffic effects compared to the current proposed option. Delivery via Galway Port allows for the shortest and more direct route to the proposed wind farm site, with the lowest number of pinch points. It therefore has the lowest potential impact. In addition, Galway Port has an established history of turbine import operations, and precedent exists for the movement of blades larger than those proposed for this project. The port of entry and TDR are only relevant for the construction phase, so the operational and decommissioning phases are not considered below.

3.4.3.8 Turbine Delivery Route (TDR)

It is proposed that the turbine components will be delivered to the proposed wind farm site via Galway Port in Co. Galway as shown in Figure 2-3.

Following the selection of Galway Port as the preferred port of entry for the delivery of wind turbine components, an assessment of potential routes from the port to the proposed project site was undertaken. Particular consideration was given to the available route options for exiting Galway City, where road geometry, turning constraints, road width and the potential requirement for enabling works or third-party land take were key factors in determining route suitability. The alternative routes considered and the rationale for the selection of the preferred route are summarised in Table 3- 10. Further details including a map of these options are provided in Section 5 of Appendix 2.4 (Turbine Delivery Route Report)

Table 3- 10: Route Alternatives Considered from Galway Port (Summarised from Appendix 2-4 – Turbine Delivery Route Report)

Route Option	Route Description	Key Constraints	Outcome
1	From the Port of Galway, via Lough Atalia Road and the R339, turning left onto the R338 and proceeding via Moneenageisha Road.	Discounted due to the tight left turn onto the R338 at the Bayview Guesthouse junction. The manoeuvre would require the blade to oversail the car park and land to the east of the R339. The steep gradient on Moneenageisha Road was also identified as a potential constraint.	Not Selected
2	From the Port of Galway, via Lough Atalia Road and the R339, following an alternative alignment through the R338/R339 junction.	Considered less favourable because the route would require the removal of traffic signals at the R338/R339 junction and was approximately 2 km longer than the preferred route.	Not Selected
3	From the Port of Galway, via Lough Atalia Road and the R339, continuing towards the N83 before diverting onto a local road and rejoining the N84.	Discounted due to the narrow local road and multiple tight bends. Potential third-party land take at the N83 junction, together with a sharp turn onto the N84 constrained by trees, shrubbery and a stone wall, presented additional difficulties.	Not Selected
4	From the Port of Galway, via Lough Atalia Road and the R339, continuing towards College Road and the R336 to access the N6 and subsequently the N84.	Selected as the preferred route through Galway City. The route exits the port via Lough Atalia Road, continues onto the R339 and connects to the R336/N6 corridor. This avoids the specific constraints identified for Options 1–3.	Selected

A SPA of the delivery of the Turbine Blades was undertaken using Autodesk Civil 3D Vehicle Tracking software, incorporating AutoCAD embedded aerial imagery and, where available, detailed topographic survey data. The analysis was used to assess the manoeuvrability of the Blade Delivery vehicles along the proposed TDR, having regard to existing road geometry, junction layouts, and physical constraints such as street furniture. From the SPA, areas requiring accommodation works to accommodate the delivery of the Turbine Blades were determined.

The deliveries of turbine components to the proposed wind farm site will be made in convoys of three to five vehicles and mostly at night when roads are quietest. Convoys will be accompanied by escorts at the front and rear operating a "stop and go" system. Although the turbine delivery vehicles are large, they will not prevent other road users or emergency vehicles passing, should the need arise. The delivery escort vehicles will ensure the turbine transport is carried out in a safe and efficient manner with minimal delay or inconvenience for other road users.

There will be some delays to local traffic at pinch points. During these periods, it may be necessary to operate local diversions for through traffic

Prior to the construction of the proposed project a test run of the proposed transport operation along the proposed route will be completed using vehicles with attachments to simulate the dimensions of the turbine components. Following this test run, the Traffic Management Plan will be reviewed and updated with the haulage company when the final transport arrangements are known, delivery dates confirmed and escort proposals in place. The plan will then be submitted to Galway and Mayo County Councils for agreement in writing in advance of any abnormal loads using the local roads. The plan will provide for all necessary safety measures, including a convoy and Garda escort as required, off-peak turning/reversing movements and any necessary safety controls. Appendix 2-4 (TDR Report) presents an assessment of the temporary accommodating works required along the TDR option route. Route constraints and pinch points identified by the Turbine Blade SPA are marked on the drawings as "Node Points".

3.4.3.9 Site Entrances

The proposed wind farm site will be accessed via two site access tracks off the R334 Regional Road and will facilitate both materials delivery (stone, steel and concrete) as well as large oversize components such as turbine blades, tower sections and substation components. For further information see Chapter 17 and the TMP (Appendix 17-1).

The site accesses/entrances will remain in place during the operation and decommissioning phases as they will facilitate access for operation and maintenance vehicles as well as the delivery of any wind turbine components that may require replacement/upgrade. The proposed site entrances will have adequate visibility as also discussed in Chapter 17.

During early-stage design development, two alternative access layout options were examined for the two land parcels located north and south of the R334 Regional Road. This section of the R334 is straight offering good visibility in both directions.

Alternative option A proposed positioning the entrance to the southern parcel directly opposite the entrance to the northern parcel. This required a slightly longer access track to connect back to the currently proposed access track in the southern parcel. An alternative entrance into the northern parcel was also briefly considered in the early stage of the project. This was via the

local road in the townland of Kinlough, north-west of Kinlough Church. The currently proposed site entrance layout was also examined during the design process. Under this option, the entrance to the northern parcel remained in its existing location, while the entrance to the southern parcel was repositioned approximately 450 m south along the R334 Regional Road.

All options are shown in Figure 3-12 and assessed in Table 3- 11.

9°9'48"W

53°36'15"N

53°25'25"N

525000

N

R334

T1 T2 T3 T4 T5 T6 T7 T8 T9 T10 T11 T12 T13



Legend

- Proposed wind farm site
- Turbine Locations
- Proposed site access track
- Access Track to Connect Alternative Entrance
- Alternative Entrance
- Proposed Entrances

0 150 300
Meters

Spatial Reference
Datum: IRENET95
EPSG: 2157

Copyrights:
Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community,

Rev	Date	Description	By	Chkd.
A	15/10/2026	First issue	K.K	J.S

Client: ROOAUNALAGHTA Green Energy

Project:

Rooaunalaghta Green Energy Project

Title:

Figure 3-13:
Proposed site entrance and alternatives

Scale @ A3: 1:9,000

Prepared by:	Checked by:	Date:
K.Kale	J.Staunton	October 2026

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Map Ref: 11981-041-Alt-S.ENT-TOB-A

Draft: A

Table 3- 11: Table of potential environmental effects relative to proposed site entrances

Environmental Considerations	Option A – Entrances directly opposite each other on the Regional Road	Option B – Entrance from local road at Kinlough to lands north of R334	Option C – Staggered access points on R334 (preferred)
Human Health and Population	The directly opposite site entrances on the R334 may result in a driver inadvertently crossing the regional road without stopping, increasing the potential risk of an accident. This also has increased noise, dust and emissions which reduce residential amenity. This results in a slightly increased potential for significant effects for construction/operational/decommissioning phases.	This required the site entrance to utilise a narrow road network and pass multiple sensitive receptors with associated increased potential impacts from noise, dust and road safety. This results in an increased potential for significant effects for construction/operational/decommissioning phases.	Reduced risk of accident as drivers are less likely to inadvertently drive onto the R334. Slightly increased noise, dust and emissions due to the vehicles driving along the R334, which reduce residential amenity. This results in a slightly decreased potential for significant effects for construction/operational/decommissioning phases.
Biodiversity	There would be a slightly larger footprint for the proposed works, resulting in additional loss of improved agricultural grassland habitat. This results in a slightly increased potential for significant effects for construction/operational/decommissioning phases.	No likely significant adverse effects for construction/operational/decommissioning phases.	No likely significant adverse effects for construction/operational/decommissioning phases.
Ornithology	No likely significant adverse effects for construction/operational/decommissioning phases.	No likely significant adverse effects for construction/operational/decommissioning phases.	No likely significant adverse effects for construction/operational/decommissioning phases.
Land, Soils and Geology	The larger works footprint would result in an increased demand for stone material. This results in a slightly increased potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.	No likely significant adverse effects for construction/operational/decommissioning phases.	The slightly smaller works footprint would result in a decreased demand for stone material. This results in a slightly decreased potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.
Hydrology and Hydrogeology	No likely significant adverse effects for construction/operational/decommissioning phases.	No likely significant adverse effects for construction/operational/decommissioning phases.	No likely significant adverse effects for construction/operational/decommissioning phases.
Climate	There would be slightly greater levels of emissions associated with the larger works footprint. This results in a slightly increased potential for significant effects for construction	No likely significant adverse effects for construction/operational/decommissioning phases.	There would be slightly lower levels of emissions associated with the smaller works footprint. This results in a slightly decreased potential for significant effects for

	phase. No likely significant adverse effects for operational/decommissioning phases.		construction phase. No likely significant adverse effects for operational/decommissioning phases.
Air Quality	There would be a slightly larger footprint for the proposed works near the R334. This results in a slightly increased potential for significant effects for construction/operational/decommissioning phases.	The additional traffic on the local road network will pass by multiple sensitive receptors causing a greater dust and emission nuisance. This results in a slightly increased potential for significant effects for construction/operational/decommissioning phases.	There would be a slightly smaller footprint for the proposed works. This results in a slightly decreased potential for significant effects for construction/operational/decommissioning phases.
Landscape & Visual	There would be a slightly larger footprint for the proposed works near the public road. This results in a slightly increased potential for significant effects for construction/operational/decommissioning phases.	No likely significant adverse effects for construction/operational/decommissioning phases.	There would be a slightly smaller footprint for the proposed works. This results in a slightly decreased potential for significant effects for construction/operational/decommissioning phases.
Material Assets	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases.	No likely significant adverse effects for construction/operational/decommissioning phases.
Noise and Vibration	There would be a slightly larger footprint for the proposed works, resulting in additional noise generation near the R334, though not passing as many sensitive receptors as Option B (same as Option C). This results in a slightly increased potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.	The additional traffic on the local road network will pass by multiple sensitive receptors causing a greater noise nuisance. This results in a slightly increased potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.	There would be a slightly smaller footprint for the proposed works, resulting in less noise generation near the R334 and passing fewer noise sensitive receptors than Option B (same as Option A). This results in a slightly decreased potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.
Archaeology and Cultural Heritage	There would be a slightly larger footprint for the proposed works, resulting in additional ground disturbance. This results in a slightly increased potential for significant effects on previously unknown archaeology for construction phase. No likely significant adverse effects for operational/decommissioning phases.	No likely significant adverse effects for construction/operational/decommissioning phases.	There would be a slightly smaller footprint for the proposed works. This results in a slightly decreased potential for significant effects for construction/operational/decommissioning phases.
Traffic and Transportation	The directly opposite site entrances on the R334 may result in a driver inadvertently crossing the regional road without	The increased heavy traffic on the narrow winding local road network would have an	Drivers are less likely to inadvertently drive onto the R334, decreasing the potential risk

	stopping, increasing the potential risk of an accident. This results in a slightly increased potential for significant effects for construction/operational/decommissioning phases.	elevated road safety risk. This results in a slightly increased potential for significant effects for construction/operational/ decommissioning phases.	of an accident. This results in a slightly decreased potential for significant effects for construction/operational/decommissioning phases.

Option A was discounted following review by the traffic assessment team, who identified a significant road-safety concern. If the two access points were directly aligned, there would be a risk that a vehicle exiting one parcel could continue straight ahead, without stopping or recognising the presence of a junction, and inadvertently enter the R334 Regional Road. This creates a potential collision hazard for through-traffic on the regional road. For this reason, and in order to avoid the possibility of a vehicle failing to stop at the junction, Option A was removed from further consideration on safety grounds.

Option B was found to be too constrained with narrow winding roads and the easier access onto the wider R334 was found to be preferred. This route would have resulted in greater potential for effects, particularly in terms of traffic, noise and air quality.

Option C provides clear separation on the R334 between the access points to the two parcels, thereby removing the safety concern identified in alternative option A. It also provides access directly onto the regional road with a reduced impact on sensitive receptors located on the local road network.

3.4.3.10Electrical Grid Connection Options

For the proposed project it was necessary to consider options for grid connection, including such aspects as distance to potential connection nodes and grid capacity at the nodes to accommodate the connection. Based on the scale of the proposed project, a 110 kV connection to the national grid network is required to accommodate the likely output from the proposed project. Connection will be sought from the grid system operators by application to EirGrid.

3.4.3.10.1 Connection Options:

3.4.3.10.1.1 Tail-Fed 110 kV:

The closest 110 kV substation is Cloon 110 kV substation to the south of Tuam in Co. Galway, which is approximately 24 km along the local, regional and national road network. Direct "tail-fed" connection to Cloon 110 kV substation was ruled out at an early stage due to distance and prohibitive cost.

Another possibility is to install a 110 kV substation within the wind farm site and install a 110 kV grid connection cable to the closest existing 110 kV Overhead line (OHL) between Dalton and Galway substations. This would require construction of a 110 kV substation (Tail-fed) on the wind farm site and another 110 kV substation (Loop-in) at the point of connection to the OHL. The cost of constructing two substations of this scale would be cost prohibitive and would have greater environmental effects.

3.4.3.10.1.2 Connection at 110 kV utilising 33 kV Cable:

Following the above analysis, it was considered that a 33 kV private grid connection cable, connecting an on-site control building to a proposed new 110 kV substation would be the most suitable connection methodology based on technically acceptable electrical design, civil infrastructure requirements and cost considerations.

3.4.3.10.2 Route Options:

For the proposed project, six grid connection options were considered. Following the consideration of alternatives, a single grid connection route has been brought forward as part

of this planning application. All six options are considered in Table 3- 12 below (numbered one to six) and the routes are shown in Figure 3-13.

Table 3- 12:Grid connection route options

Grid Connection Route Option	Overview	Constraints	Assessment of Route
1	Grid Connection Route Option 1 is the shortest out of the routes assessed and has an approximate length of 5.5 km. It proposes to connect to the existing 110 kV Overhead Line (OHL) East of the village of Shrule. The connection then converges into an Underground Cable (UGC) connection. Despite being the shortest alignment, it passes directly through the village of Shrule where underground services are densely concentrated. The increased likelihood of utility conflicts, combined with heightened traffic management and stakeholder constraints, results in a comparatively high construction and programme risk.	• Variable ground conditions, including shallow/protruding bedrock. • Difficult terrain on local roads/tracks, with sharp turning and limited working width. • Multiple utility/service crossings anticipated (water services and LV cables in places). • N84 corridor and bridge crossing constraint. • Working through/adjacent to Shrule: higher service density and traffic management constraints. • Private land sections/entries: landowner access agreements and wayleaves required.	This route has a number of positives aspects, including the length of the route, which reduces the impact (shorter construction timeline). However, there are a number of issues with the substation location, in particular; 1. the proximity to the village of Shrule and the related impact during construction of both the substation compound and the grid connection ducting and cabling, 2. The GCR traverses through the village of Shrule, which would require a significant number of utility service crossings and diversions. While the above are not insurmountable, the other options assessed are more advantageous and this option has not been progressed further.
2	UGC Route Option 2 has an approximate length of 6.3 km. It proposes to connect to the existing 110 kV Overhead Line on private lands in Tonacooleen. East of the village of Shrule the connection then converges into a UGC connection. This OHL is more in a south-easterly direction compared to Route Option 1. This route option begins at L-6100 and heads west for approximately 280 m until crossing the N84 at the crossroad. The UGC then heads straight onto the local road	• Proposed Substation location is in close proximity to the River Black. • Variable ground conditions, including shallow/protruding bedrock. • Constrained local roads (L-21044 / L-16152) with tight bends and localised pinch points. • Multiple water services, culverts and drainage features anticipated along the alignment.	This route option avoids the village of Shrule and the potential crossing of the historical bridge in Shrule to the south of the village arising from Route Option 1 by utilising the local road network from the wind farm site. The substation location has the benefit of suitable separation distance from nearby dwellings, close proximity to the existing OHL and an access from a tertiary local road. However, the substation location is circa 200 m to the River Black and the ground conditions seem to be heavy and may contain deep peat in part of the proposed location (turbary

Grid Connection Route Option	Overview	Constraints	Assessment of Route
	L-21044. It diverts onto private lands on the local road at "Brodullagh South" and into the wind farm site.	• Multiple narrow road sections as well as sharp turns along the tertiary roads • Bridge crossings: confirm cover/structural constraints; at least one bridge crossing likely requires HDD.	adjacent to the location). In addition, the proposed lands form part of a separate third party development and would not be available for this project. The GCR is predominantly in the local public road network with a section (approx. 1 km) in private lands close to the wind farm. For the above reasons relating to the substation location, this option has not been progressed further.
3	UGC Route Option 3 has an approximate length of 7 km. This route follows the same route as Route Option 2. This option diverges from it at the T-junction where the L-6100 and meets the L-2104. The route continues along the L2104, then travels north on the local "Killamonagh" road to a proposed 110 kV substation location in the townland of Ballinvoher.	• Variable ground conditions, including shallow/protruding bedrock. • Constrained local roads (L-21044 / L-16152) with tight bends and localised pinch points. • Multiple water services, culverts and drainage features anticipated along the alignment. • Multiple narrow road sections as well as sharp turns along the local road network • Bridge crossings: confirm cover/structural constraints; at least one bridge crossing likely requires HDD.	This route option follows a similar route to option 2 and avoids the village of Shrule. The substation location has the benefit of suitable separation distance from nearby dwellings, close proximity to the existing OHL and an access from a local road. The ground conditions seem suitable from a desktop and survey from the public road, however, the footprint and access required more than one landholding and it was not possible to secure all of the lands required. The GCR is predominantly in the local public road network with a section (approx. 1 km) in private lands close to the wind farm. For the above reasons relating to the substation location, this option has not been progressed further.
4	Grid Option 4 comprises of a 33 kV underground grid connection from the proposed wind farm on-site control building directly to the Shancloon 110 kV substation (proposed as part of a separate	• Heavily reliant upon planning approval for the construction of the Shancloon 110 kV substation. • This option does not require any additional 110 kV infrastructure to be built with the exception of	This route option follows a similar route to option 2 but extends along the local road to the proposed Shancloon substation location. Minor works to allow connection at the Shancloon substation would be required. The GCR is predominantly in the local public road network with a section (approx. 1 km) in

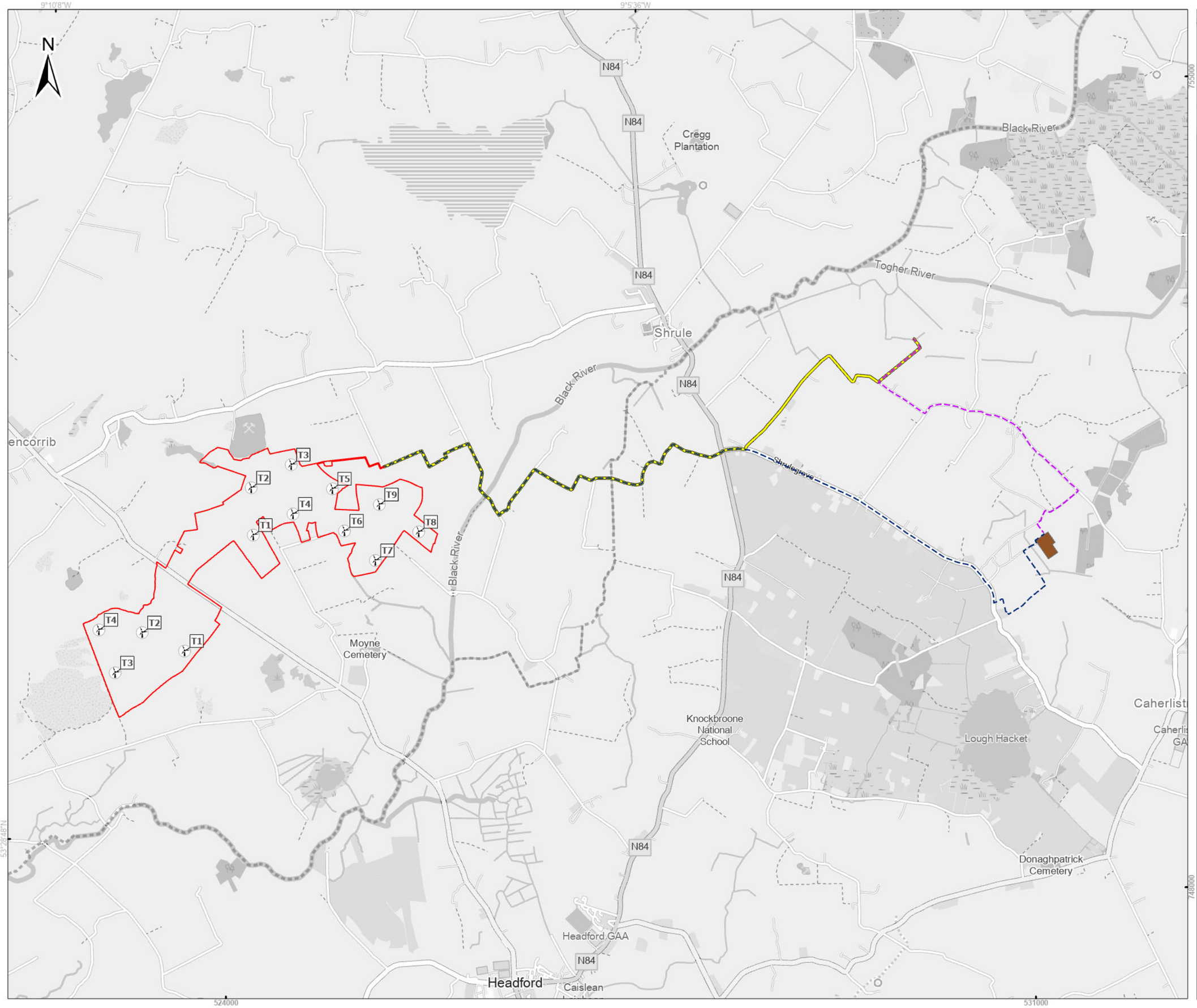
Grid Connection Route Option	Overview	Constraints	Assessment of Route
	wind farm on which a decision is due in 2026 – ACP planning ref. no. 323699) in the townland of Corillaun, Co. Galway. This option is approximately 6.8 km in length and follows the same route as Grid Option 2, but continues along the local "Tonacooleen" road to the townland of Corillaun, Co. Galway (Shancloon Substation location).	the works within the Shancloon substation to connect it. • Variable ground conditions, including shallow/protruding bedrock. • Constrained local roads (L-21044 / L-16152) with tight bends and localised pinch points. • Multiple water services, culverts and drainage features anticipated along the alignment. • Multiple narrow road sections as well as sharp turns along the local road network • Bridge crossings: confirm cover/structural constraints; at least one bridge crossing likely requires HDD.	private lands close to the wind farm. This is an advantageous connection method, however as it is contingent upon a planning grant for Shancloon 110 kV substation, which is still awaiting decision, and the substation being constructed by a third party, it has not been selected as the preferred option. On September 21st 2026, the Shancloon Wind Farm (ACP Planning Ref. 323699) was refused planning permission. The decision remains subject to the statutory challenge period and potential judicial review proceedings.
5 (Proposed GCR)	Grid Option 5 consists of a 33 kV private grid connection cable (circa 8.7 km in length) from the on-site control building to a proposed new "Loop-in" 110 kV substation at a location in the townland of Killamanagh, Co, Galway. The route follows the same route as option 3, however, it continues along the L-2104 to the townland of Killamanagh. The proposed substation location is sited close to the existing 110 kV OHL and approximately 550 m from the closest dwelling.	• Variable ground conditions, including shallow/protruding bedrock. • Constrained local roads (L-21044 / L-16152) with tight bends and localised pinch points. • Multiple water services, culverts and drainage features anticipated along the alignment. • Multiple narrow road sections as well as sharp turns along the local road network	This route broadly follows option 3 but continues along the L-2104 instead of turning north at Ballinvoher. The proposed 110 kV substation location is particularly well suited as it is over 550 m from the closest dwellings, close to the existing OHL, in less sensitive improved agricultural grassland, on relatively flat topography and is not at an elevated location. The GCR is predominantly in the local public road network with a section (approx. 1 km) in private lands close to the wind farm.

Grid Connection Route Option	Overview	Constraints	Assessment of Route
		• Bridge crossings: confirm cover/structural constraints; at least one bridge crossing likely requires HDD.	This Option has been selected as the preferred option route for the reasons set out above.
6	Grid Option 6 consists of a 33 kV private grid connection cable (circa 6.8 km in length) from the on-site control building to a proposed new tail-fed 110 kV substation at a location in the townland of Killamanagh, Co, Galway. The grid connection comprises a 3.2 km 110 kV underground cable extending from the project's 110 kV substation to the Shancloon 110 kV substation (proposed as part of a separate wind farm on which a decision is due in 2026 – ACP planning ref. no. 323699) in the townland of Corillaun, Co. Galway.	• Variable ground conditions, including shallow/protruding bedrock. • Difficult terrain on local roads/tracks, with sharp turning and limited working width. • Given the similarities with Grid Route Option 5, the assessment below addresses only those constraints that are unique to Grid Route Option 6. • Heavily reliant upon ACP approval of planning permission and a third party for the construction of the Shancloon 110 kV substation. • An additional 3.2 km of 110 kV cable must travel between the tail-fed 110 kV station to the Shancloon substation. This include transversing 2.1 km of a public road, leading to additional disruptions to motorist. • Additional expensive associated with the 110 kV cable connecting the two substations.	This route follows the same route as option 5 from the wind farm site to the proposed 110 kV substation at Killamanagh. However, the substation at Killamanagh will be of "Tail-Fed" design and will not connect to the existing OHL, it will instead connect to the proposed Shancloon 110 kV Substation via a 3.2 km 110 kV cable. Similar to option 4, this route is reliant upon a planning grant for Shancloon 110 kV substation. As outlined in Option 4, planning permission for the associated development was refused in September 2026. However, the decision remains within the period for potential judicial review. This option is also likely to be significantly more expensive to deliver when compared to option 4. While the above are not insurmountable challenges, and the option was deemed to be feasible, the other options assessed are more advantageous and this option has not been progressed further.

Table 3- 13: Table of potential environmental effects relative to proposed GCR

Environmental Considerations	Grid Option 1	Grid Option 2	Grid Option 3	Grid Option 4	Grid Option 6	Grid Option 5 (preferred)
Human Health and Population	Route passes through the village of Shrule with associated impacts there. It has the greatest potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.	Passes a greater number of sensitive receptors so it has an increased potential for significant effects. It is likely to have a lower effect than Alternative A and E, similar to C and D for construction phase. No likely significant adverse effects for operational/decommissioning phases.	Passes a greater number of sensitive receptors so it has an increased potential for significant effects. It is likely to have a lower effect than Alternative A and E, similar to B and D for construction phase. No likely significant adverse effects for operational/decommissioning phases.	Passes a greater number of sensitive receptors so it has an increased potential for significant effects. It is likely to have a lower effect than Alternative A and E, similar to B and C for construction phase. No likely significant adverse effects for operational/decommissioning phases.	Longest route which passes a greater number of sensitive receptors so it has an increased potential for significant effects. It is likely to have a lower effect than Alternative A, but greater than B, C and D.	Passes a greater number of sensitive receptors when compared A, B, C and D so it has an increased potential for significant effects. It is likely to have a lower effect than Alternative A and E, similar to B and D for construction phase. No likely significant adverse effects for operational/decommissioning phases.
Biodiversity	Less works on greenfield ground (albeit improved agricultural grassland) and shortest route, with associated slight reduced potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.	The route is contained almost entirely within the existing road network, and therefore has a reduced potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.	The route is contained almost entirely within the existing road network, and therefore has a reduced potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.	The route is contained almost entirely within the existing road network, and therefore has a reduced potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.	Longest route with additional works on greenfield sites. Greatest potential for significant effects.	The route is contained almost entirely within the existing road network, and therefore has a reduced potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.
Ornithology	No likely significant adverse effects for construction/operational/decommissioning phases.	No likely significant adverse effects for construction/operational/decommissioning phases.	No likely significant adverse effects for construction/operational/decommissioning phases.	No likely significant adverse effects for construction/operational/decommissioning phases.	No likely significant adverse effects for construction/operational/decommissioning phases.	No likely significant adverse effects for construction/operational/decommissioning phases.
Land, Soils and Geology	Shortest route with associated reduced potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.	Substation located in an area of deep peat which increases the risk for impacts. Shorter route with associated slightly reduced potential impacts. Overall, it has the greatest potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.	Shorter route with associated slightly reduced potential impacts for construction phase. No likely significant adverse effects for operational/decommissioning phases.	Shorter route with associated slightly reduced potential impacts for construction phase. No likely significant adverse effects for operational/decommissioning phases.	Longest route with additional works on greenfield sites. Greatest potential for significant effects.	Shorter route than Alternative E, with associated slightly reduced potential impacts for construction phase. No likely significant adverse effects for operational/decommissioning phases.
Hydrology and Hydrogeology	Shortest route with associated slightly reduced potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.	Substation located near the River Black and located in an area of deep peat which increases the risk for impacts. Shorter route with associated slightly reduced potential impacts. Overall, it has the greatest potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.	Shorter route with associated slightly reduced potential impacts for construction phase. No likely significant adverse effects for operational/decommissioning phases.	Shorter route with associated slightly reduced potential impacts for construction phase. No likely significant adverse effects for operational/decommissioning phases.	Longest route with additional works on greenfield sites. Greatest potential for significant effects.	Shorter route than Alternative E, with associated slightly reduced potential impacts for construction phase. No likely significant adverse effects for operational/decommissioning phases.
Climate	Shortest route with associated reduced emissions and slight reduced potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.	Slightly shorter route with very slightly reduced emissions (but more than Alternative A) for construction phase. No likely significant adverse effects for operational/decommissioning phases.	Slightly shorter route with very slightly reduced emissions (but more than Alternative A) for construction phase. No likely significant adverse effects for operational/decommissioning phases.	Slightly shorter route with very slightly reduced emissions (but more than Alternative A) for construction phase. No likely significant adverse effects for operational/decommissioning phases.	Longest route with most emissions. Greatest potential for significant effects.	Shorter route than Alternative E, with slightly reduced emissions (but more than Alternatives A, B, C and D) for construction phase. No likely significant adverse effects for operational/decommissioning phases.
Air Quality	The works through the village of Shrule will have a greater risk of dust and emission nuisance, resulting in the greatest potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.	The works near the sensitive receptors to the northeast of the proposed wind farm site on the L1615 will have a slightly greater risk of dust and emission nuisance, resulting in an increased potential for significant effects for construction phase. No likely significant	The works near the sensitive receptors to the northeast of the proposed wind farm site on the L1615 will have a slightly greater risk of dust and emission nuisance, resulting in an increased potential for significant effects for construction phase. No likely significant	The works near the sensitive receptors to the northeast of the proposed wind farm site on the L1615 will have a slightly greater risk of dust and emission nuisance, resulting in an increased potential for significant effects for construction phase. No likely significant	Longest route with additional works resulting in greater dust and emission nuisance. Increased potential for significant effects.	The works near the sensitive receptors to the northeast of the proposed wind farm site on the L1615 will have a slightly greater risk of dust and emission nuisance, resulting in an increased potential for significant effects for construction phase. No likely significant

		adverse effects for operational/decommissioning phases.	adverse effects for operational/decommissioning phases.	adverse effects for operational/decommissioning phases.		adverse effects for operational/decommissioning phases.
Landscape & Visual	No likely significant adverse effects for construction/operational/decommissioning phases.	No likely significant adverse effects for construction/operational/decommissioning phases.	No likely significant adverse effects for construction/operational/decommissioning phases.	No likely significant adverse effects for construction/operational/decommissioning phases.	No likely significant adverse effects.	No likely significant adverse effects for construction/operational/decommissioning phases.
Material Assets	The route through Shrule village will require significant interactions with underground services. This has the greatest potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.	No likely significant adverse effects for construction/operational/decommissioning phases for construction phase. No likely significant adverse effects for operational/decommissioning phases.	No likely significant adverse effects for construction/operational/decommissioning phases for construction phase. No likely significant adverse effects for operational/decommissioning phases.	No likely significant adverse effects for construction/operational/decommissioning phases for construction phase. No likely significant adverse effects for operational/decommissioning phases.	Longest route with additional works resulting in greater potential for interactions with underground services. Increased potential for significant effects.	No likely significant adverse effects for construction/operational/decommissioning phases for construction phase. No likely significant adverse effects for operational/decommissioning phases.
Noise and Vibration	The works through the village of Shrule will have the greatest risk of noise and vibration impact, resulting in the greatest potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.	The works near the sensitive receptors to the northeast of the proposed wind farm site on the L1615 will have a slightly greater risk of noise and vibration impact, resulting in an increased potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.	The works near the sensitive receptors to the northeast of the proposed wind farm site on the L1615 will have a slightly greater risk of noise and vibration impact, resulting in an increased potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.	The works near the sensitive receptors to the northeast of the proposed wind farm site on the L1615 will have a slightly greater risk of noise and vibration impact, resulting in an increased potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.	Longest route with additional works resulting in greater potential for noise and vibration nuisance. Increased potential for significant effects.	The works near the sensitive receptors to the northeast of the proposed wind farm site on the L1615 will have a slightly greater risk of noise and vibration impact, resulting in an increased potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.
Archaeology and Cultural Heritage	The route passes a historical bridge in Shrule resulting in the greatest potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.	The route is almost entirely within existing road corridors and therefore has a reduced chance of disturbing an unknown archaeological feature. This has a slightly reduced potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.	The route is almost entirely within existing road corridors and therefore has a reduced chance of disturbing an unknown archaeological feature. This has a slightly reduced potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.	The route is almost entirely within existing road corridors and therefore has a reduced chance of disturbing an unknown archaeological feature. This has a slightly reduced potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.	Longest route with additional works resulting in greater potential for interactions with unrecorded features. Increased potential for significant effects.	The route is almost entirely within existing road corridors and therefore has a reduced chance of disturbing an unknown archaeological feature. This has a slightly reduced potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.
Traffic and Transportation	The works through the village of Shrule will have the greatest potential for road safety risks, resulting in the greatest potential for significant effects for construction phase. No likely significant adverse effects for operational/decommissioning phases.	No likely significant adverse effects for construction/operational/decommissioning phases for construction phase. No likely significant adverse effects for operational/decommissioning phases.	No likely significant adverse effects for construction/operational/decommissioning phases for construction phase. No likely significant adverse effects for operational/decommissioning phases.	No likely significant adverse effects for construction/operational/decommissioning phases for construction phase. No likely significant adverse effects for operational/decommissioning phases.	Longest route with additional works resulting in greater potential for road safety risks. Increased potential for significant effects.	No likely significant adverse effects for construction/operational/decommissioning phases for construction phase. No likely significant adverse effects for operational/decommissioning phases.





Legend

- Proposed wind farm site
- Turbines locations
- Proposed 110kV Substation

GCR Options

- GCR Option 1
- GCR Option 2
- GCR Option 3

0 500 1,000
Meters

Spatial Reference
Datum: IRENET95
EPSG: 2157

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Sources: Map data © OpenStreetMap contributors, Microsoft, Esri Community Maps contributors, Map layer by Esri, ©

Rev	Date	Description	By	Chkd.
A	14/10/2026	First issue	K.K	J.S.

Client: ROOAUNALAGHTA Green Energy

Project:

Rooaunalaghta Green Energy Project

Title:

Figure 3-14:
Grid connection route options

Scale @ A3: 1:30,000

Prepared by:	Checked by:	Date:
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Map Ref: 11981-003-3.GCR-S.BO-TOB-A

Draft: A

Grid option 5 was found to be the preferred GCR as it utilised a relatively short route with minimal sensitive receptors near it. It avoids settlements, areas of deep peat, the land was available and the route is not dependant on other separate projects being approved planning and getting constructed before the proposed project.

Considering the details set out in Table 3- 12and Table 3- 12, while other routes are feasible and have their merits, it is proposed that Grid Connection Route Option 5 is the most suitable option and the preferred route for a number of reasons, in particular; the substation is well located, away from dwellings and in close proximity to existing OHL on improved agricultural grassland with suitable ground conditions. There are constraints along the GCR, however, challenges can be overcome through good planning as set out in Chapter 17, Traffic and Transportation, and construction works on the GCR can be managed through traffic management to minimise disruption.

The proposed 110 kV substation, to be located in the townland of Killamanagh, Co. Galway, together with its associated works, would connect to the existing overhead line traversing the townlands of Killamanagh and Bunnasillagh. Overall, the balance achieved between route length, technical risk, and construction feasibility confirms this option as the most favourable connection solution.

3.4.3.10.3 110 kV Substation location

There was an alternative location considered for the proposed 110 kV substation which was located a short distance from the currently proposed location (see Table 3- 14). It was initially proposed to construct the substation in the northeastern corner of the same landholding however following a site survey by project team ecologists, it was found that the location would disturb an existing badger sett. The initial location was considered as it was the furthest point from the public road and dwellings and may result in less noise at sensitive receptors, however, it was also at the top of a hill and would have been more visible from the surrounding area. The topography of the field lends itself to the revised location, which is much lower down and would not require as much earthworks. Following this, it was moved to the preferred location, although slightly closer to dwellings and the public road, the location is still at a significant distance and there are no likely significant adverse noise and vibration effects for construction/operational/decommissioning. The alternative location would have had a greater potential effect in terms of ecology and visual impact than the current location.

Table 3- 14: Table of potential environmental effects relative to proposed substation location

Environmental Considerations	Option A – Location to the northeastern corner of the field	Option B – More central in field (preferred)
Human Health and Population	Located on a higher ground level, greater visibility means the residential amenity of the nearby area could be impacted. This results in a slightly increased potential for significant effects for construction/operational/decommissioning phases.	Located on a lower level than the alternative location and on flatter topography. This location will require less cut and fill for construction and will be less visible from the public road. No likely significant adverse effects for construction/operational/decommissioning phases

Biodiversity	The location would cause disturbance/damage to a badger sett. This results in a greater potential for significant effects for construction/operational/decommissioning phases.	No likely significant adverse effects for construction/operational/decommissioning phases.
Ornithology	No likely significant adverse effects for construction/operational/decommissioning phases so	No likely significant adverse effects for construction/operational/decommissioning phases.
Land, Soils and Geology	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases.
Hydrology and Hydrogeology	No likely significant adverse effects for construction/operational/decommissioning phases.	No likely significant adverse effects for construction/operational/decommissioning phases.
Climate	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases.
Air Quality	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases.
Landscape & Visual	Location is more elevated, though further from the road with an overall slightly more imposing visibility. This results in a slightly increased potential for significant effects for construction/operational/decommissioning phases.	Located on a lower level than the alternative location and on flatter topography. This location will require less cut and fill for construction and will be less visible from the public road. No likely significant adverse effects for construction/operational/decommissioning phases
Material Assets	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases
Noise and Vibration	No likely significant adverse effects for construction/operational/decommissioning phases	Although slightly closer to dwellings and the public road, the location is still at a significant distance and there are no likely significant adverse effects for construction/operational/decommissioning phases
Archaeology and Cultural Heritage	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases
Traffic and Transportation	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases

3.4.3.10.4 On-site Control Building location

The criteria for selection of a suitable location for the on-site control building included;

- The requirement of a footprint of approximately 0.5 Acres to allow for building and ancillaries;
- Located to the Eastern boundary of the site, closest side to the proposed 110 kV substation;

- At least 150 m from a turbine location, which is greater than the proposed turbine tip height; and,
- Along or nearby, proposed or existing internal access tracks. Proximity to existing is preferred.

Utilising this criteria, two potential locations were identified for analysis, see Figure 3-14.

.



Figure 3-14: On-site Control Building Location Options

Table 3- 15 compares the merits of these locations and the rational for selection of the onsite control building location.

Table 3- 15: Table of comparison of potential on-site control building locations

Considerations	Option A – Location 350 m East of T7	Option B – Location 150 m East of T13
Utilisation of Existing Infrastructure	Located adjacent to an existing access track. More suitable due to the use of existing infrastructure.	Located near proposed access track. Additional access track of circa 200 m required to facilitate location.
Ecology	Less suitable from an ecology perspective as area is on mosaic habitat.	Preferable from an ecology perspective as area is improved agricultural grassland
Health & Safety, Emergency Access	More centrally located within the site for access during operational phase. More suitable from a Health and Safety perspective or in case of an emergency for access to first aid etc.	Located in the most North-Easterly location on the wind farm site. Furthest location from the site entrance.
Site Welfare	More centrally located within the site for access during operational phase. More suitable for Welfare reasons.	Located in the most North-Easterly location on the wind farm site. Furthest location from the site entrance and all turbines except T11, T12 and T13.

Based on the results of the comparison set out in Table 3-15, Option A was selected as the most suitable location for On-site Control Building.

3.5 ALTERNATIVE PROCESSES

3.5.1 Alternative Technology

An alternative technology for the grid connection type would be an overhead line (OHL). Table 3- 16provides consideration of this alternative grid connection technology.

Table 3- 16: Table of potential environmental effects of grid connection technology

Environmental Considerations	Option A – Overhead Line	Option B – Underground cable (preferred)
Human Health and Population	Potential for greater long-term visual presence in the landscape and for nearby residents. Construction effects typically more localised at pole/tower locations.	Construction effects concentrated along the cable route. Limited long-term visual presence once reinstated. Generally lower long-term effects on residential amenity.
Biodiversity and Ornithology	Reduced ground disturbance between structures but greater potential for permanent habitat fragmentation at structure locations and potential bird interaction effects.	Greater temporary vegetation clearance within the working corridor and potential disturbance during trench excavation. Habitats can generally be reinstated following construction.
Land, Soils and Geology	Reduced excavation requirements but more localised excavation at pole/tower bases. Lower overall disturbance footprint.	Greater excavation requirements, increased soil disturbance and temporary impacts on subsoils and bedrock along the route.
Hydrology and Hydrogeology	Generally reduced interaction with watercourses and groundwater due to limited excavation requirements.	Greater potential for temporary impacts associated with trenching, watercourse crossings, dewatering and groundwater interaction during construction.
Material Assets	Greater potential for interactions with telecommunications and aviation safeguarding constraints due to the presence of above-ground infrastructure.	Reduced potential for interactions with aviation and telecommunications infrastructure once installed. Greater interaction with buried services during construction.
Climate and Air Quality	Generally reduced construction dust and emissions due to lower excavation requirements. Embodied carbon depends on structure type, conductor requirements and route length.	Greater temporary dust and emissions during construction resulting from excavation activities. Higher embodied carbon associated with cable manufacture and extensive excavation works.
Landscape & Visual	Greater landscape and visual effects due to the permanent presence of poles/towers and conductors.	Generally the most favourable option due to the absence of permanent above-ground infrastructure. Temporary construction impacts only
Noise and Vibration	Reduced construction noise overall, but potential for low-level operational noise from conductors during certain weather conditions.	Greater temporary construction noise associated with trenching and reinstatement works. No operational noise effects.
Cultural Heritage	Reduced impacts on buried archaeology but greater potential for indirect effects on the setting of cultural heritage features due to visible structures.	Greater risk of significant effects on buried archaeology due to excavation along the GCR.
Traffic and Transportation	Reduced construction traffic and shorter working areas, with effects concentrated around structure locations.	Greater construction traffic and longer duration works along public roads due to trench excavation and reinstatement.

Major Accidents and Natural Disaster	Greater exposure to storm damage, conductor failure and vegetation management requirements.	Reduced long-term risk of damage from severe weather and falling trees.

The overhead line option would generally result in reduced excavation requirements and lower temporary effects, particularly for soils / geology, hydrology and construction-related traffic. However, it would introduce permanent above-ground infrastructure with associated effects on landscape character, visual amenity, ornithology and nearby receptors. On balance, the underground cable option was identified as the preferred solution from an environmental perspective. This is also in line with the Draft Revised 2019 WEDGs.

An alternative technology to the use of a lidar station was considered, and that was the use of a met mast, which is traditionally used on wind farm projects. This is considered in Table 3- 17.

Table 3- 17: Table of potential environmental effects of met mast relative to proposed Lidar Unit

Environmental Considerations	Option A – Use of Met Mast	Option B – Use of Lidar Unit (preferred)
Human Health and Population	The additional infrastructure of the met mast on site may cause some annoyance to people locally, albeit a slim structure. This results in an increased potential for significant effects for the operational phase. No likely significant adverse effects for construction/decommissioning phases.	This is a small unit that will not be seen by local sensitive receptors or people on local roads. No likely significant adverse effects for construction/ operational/ decommissioning phases.
Biodiversity	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases
Ornithology	The met mast could pose a collision risk for birds flying through the site, whe compared to a LiDAR. This results in an increased potential for significant effects for the operational phase. No likely significant adverse effects for construction/decommissioning phases.	No risk to birds as there is no collision risk. No likely significant adverse effects for construction/operational/decommissioning phases
Land, Soils and Geology	The met mast would need a slightly larger foundation, meaning a slightly larger excavation and need for concrete. This results in an increased potential for significant effects.	The lidar unit would need a slightly smaller foundation, meaning a slightly smaller excavation and need for concrete. This results in a decreased potential for significant effects.
Hydrology and Hydrogeology	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases
Climate	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases
Air Quality	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases
Landscape & Visual	The met mast will be visible in the wider area and will look different to the proposed wind	The lidar unit will not be visible in the wider area. This results in a decreased potential for significant effects.

	turbines. This results in an increased potential for significant effects.	
Material Assets	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases
Noise and Vibration	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases
Archaeology and Cultural Heritage	No likely significant adverse effects for construction/operational/decommissioning phases	No likely significant adverse effects for construction/operational/decommissioning phases
Traffic and Transportation	The delivery of the met mast would require some additional truck movements in the construction phase compared to the lidar unit. This results in an increased potential for significant effects for the construction phase. No likely significant adverse effects for operational /decommissioning phases.	The delivery of the lidar unit would require only one truck movement in the construction phase. This results in a decreased potential for significant effects for the construction phase. No likely significant adverse effects for operational /decommissioning phases.

The use of an onsite operational phase lidar station will eliminate the need to build a tall met mast, thereby reducing the potential for visual effects and ecology effects in particular.

As set out in Section 3.3.2, the objective of the developer was to identify a site capable of producing circa 50-60 MW wind energy project in a suitably zoned location in the Mayo CDP 2022-2028. Other technology types (such as solar) have not been assessed as this is not in line with the project objectives to develop a wind farm and to maximise the energy capacity output from a zoned site (was in a preferred area at the time alternatives were being considered) in line with targets and objectives. While solar energy could in theory be implemented at the site as a reasonable alternative to wind energy, it would be less productive in terms of energy output for the same footprint and would contribute less towards meeting Ireland's renewable energy targets.

3.5.2 Alternative Construction Methodology

Throughout the design and assessment process, alternatives of other aspects of the proposed project were considered. A summary of this process is provided here.

The construction methods for the proposed project are dependent on a number of factors specific to the site and design, and have been considered in relation to ground conditions, foundation installation and turbine erection. Site-specific information gathered through intrusive site investigation and environmental surveys was taken into consideration when reviewing alternative methodologies for construction.

Alternative stream crossing methodologies for the GCR were considered at the outset, such as trenching within the bridge's road cover, however, inadequate depth was confirmed at the Black River following survey efforts to comply with relevant design standards and therefore this was not considered to be a viable alternative to the proposed horizontal directional drilling (HDD) there. Where other watercourses are to be crossed along the proposed GCR the most appropriate viable option will be used. (e.g. the small stream near the proposed 110 kV substation), upgraded culverts will need to be installed to allow for vehicles and the five circuits to pass (the current culvert is too narrow as well as too weak for vehicle movement with insufficient cover for cables), and the cable under crossings will be used. As the culvert needs to

be upgraded, there is a need to carry out instream works here regardless, and it is considered that the use of HDD for five circuits in such a situation introduces additional cost and complexity to the works.

3.5.3 Alternative Project Timeline/Lifespan

Alternative shorter timelines for the proposed project in terms of operational lifespan were not considered as modern turbines are now expected to have a 35-year lifespan, so any shorter of a timeline would reduce efficiency, resulting in unnecessary waste production and reduced contribution of energy.

The operational lifespan of the wind turbines was discussed when reviewing the different turbine types and specifications available on the market. Turbines are generally designed to last for 35 years, therefore the operational lifespan of the proposed project was centred around this.

3.6 CONCLUSIONS

A study of the reasonable alternatives in terms of project design, technology, location, size and scale has been undertaken and presented in this chapter. The options which are relevant to the proposed project and its specific characteristics as a large-scale wind farm in a rural area have been discussed. The overriding reason for selecting the chosen options is to maximise the renewable energy production from the site while minimising the environmental impact. For each alternative, a comparison of the potential for environmental effects has been provided.

As discussed above the siting and design of the proposed project has evolved through the consideration of alternatives and allowing for stakeholder input into the process, see Chapter 1 of this EIAR. This included initial consideration of the need for renewable energy, the site selection process, the consideration of alternative layouts, scales, and design processes.

Reasonable alternatives were considered with specific regard to the characteristics of the proposed project. Comparisons of environmental effects were noted. The alternatives chosen focused on mitigation by design in order to avoid the potential for environmental effects.

When weighed against all of the alternatives and constraints/facilitators outlined in this chapter, the proposed project has been found to be a highly suitable location for a wind farm with regard to a number of criteria including:

- wind speed;
- grid access;
- environmental effects;
- topography;
- distance from dwellings; and
- landscape character.