3. CONSIDERATION OF REASONABLE ALTERNATIVES

3.1 Introduction

Article IV of the EIA Directive as amended by Directive 2014/52/EU states that the information provided in an Environmental Impact Assessment Report (EIAR) should include 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 environmental effects. The consideration of alternatives typically refers to alternative design, technology, location, size and scale.

This section of the EIAR contains a description of the site selection criteria and the reasonable alternatives that were considered for the proposed Curraglass Renewable Energy Development in terms of other renewable energy technologies as well as site layout and transport route options to the site. This section also outlines the design considerations in relation to the wind farm, including the associated substation, construction compound and borrow pits and indicates the main reasons for selecting the chosen option with regards to its environmental impacts.

The consideration of alternatives is an effective means of avoiding environmental impacts. As set out in the '*Draft Guidelines on The Information to be Contained in Environmental Impact Assessment Reports'* (Environmental Protection Agency, 2017), the presentation and consideration of reasonable alternatives investigated is an important part of the overall EIA process.

It is important to acknowledge that although the consideration of alternatives is an effective means of avoiding environmental impacts, there are the existence of difficulties and limitations when considering alternatives. These include hierarchy, non-environmental factors and site-specific issues as outlined below.

Hierarchy

EIA is concerned with projects. The Environmental Protection Agency's draft guidelines (EPA, 2017) state that in some instances neither the applicant nor the competent authority can be realistically expected to examine options that have already been previously determined by a higher authority, such as a national plan or regional programme for infrastructure which are examined by means of a Strategic Environmental Assessment, the higher tier form of environmental assessment.

Non-environmental Factors

EIA is confined to the potential significant environmental effects that influence consideration of alternatives. However, other non-environmental factors may have equal or overriding importance to the developer of a project, for example project economics, land availability, engineering feasibility or planning considerations.

Site-specific Issues

The EPA guidelines state that the consideration of alternatives also needs to be set within the parameters of the availability of the land, i.e. the site may be the only suitable land available to the developer, or the need for the project to accommodate demands or opportunities that are site-specific. Such considerations should be on the basis of alternatives within a site, for example design and layout.

3.2 Principles of Wind Farm Site Selection

The process of identifying a suitable wind farm site is influenced by a number of factors. While wind speeds, the area of suitable or available land, and planning policy are all very important, a wind farm project must be commercially viable/competitive, as otherwise it will never attract the necessary project finance required to see it built. The grid connection, or the method by which a proposed wind farm is

connected to the national grid to export electricity from the site is of critical importance. Without viable grid connection options, a wind farm cannot be built, regardless of how good the wind speeds on a site might be, how much land is available, or how favourable a planning permission may be. The distance from any potential wind farm site to the likely grid connection point, the extent and cost of grid upgrades required to facilitate the connection of the wind farm, the delay in having those reinforcement works undertaken, are all critical factors that could render a wind farm project commercially viable or unviable.

The proposed site has been used previously for wind turbines which were granted planning permission in 2002 and were operational from 2005 until 20018. The site operated successfully and without environmental incident and so in principal, this informed the selection of this site for the current proposal.

3.2.1 Grid Connection

In order to connect to the national electricity grid that is operated by Eirgrid and ESB Networks, electricity generators require a grid connection offer. At the site in Curraglass, there is already a grid connection in place to Ballylickey 110kV substation, which will act as a facilitator for the Proposed Development and has informed the site selection.

3.3 Consideration of Alternatives

3.3.1 Methodology

The EU Guidance Document (EU, 2017) on the preparation of EIAR outlines the requirements of the EIA Directive and states that, in order to address the assessment of reasonable alternatives, the Developer needs to provide the following:

- A description of the reasonable alternatives studied; and
- An indication of the main reasons for selecting the chosen option with regards to their environmental impacts.

There is limited European and National guidance on what constitutes a 'reasonable alternative' however the EU Guidance Document (EU, 2017) states that reasonable alternatives "*must be relevant to the proposed project and its specific characteristics, and resources should only be spent assessing these alternatives".*

The guidance also acknowledges 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 current Draft EPA Guidelines (EPA, 2017) state that "*It is generally sufficient to provide a broad description of each main alternative and the key issues associated with each, showing how environmental considerations were taken into account is deciding on the selected option. A detailed assessment (or 'mini-EIA') of each alternative is not required."*

Consequently, taking consideration of the legislative and guidance requirements into account, this chapter addresses alternatives under the following headings:

- 'Do Nothing' Alternative;
- Alternative Locations;
- Alternative Layouts;
- Alternative Designs; and
- Alternative Mitigation Measures.

Each of these is addressed in the following sections.

When considering a wind farm development, given the intrinsic link between layout and design, the two will be considered together in this chapter.

3.3.2 'Do-Nothing' Option

An alternative land-use option to developing a renewable energy project at the Proposed Development site would be to leave the site as it is, with no changes made to the current land-use practice of forestry and the site would continue to be managed under the existing commercial forestry arrangements. The environmental impact of this is considered neutral in the context of the EIAR.

Additionally, and as noted in Chapter 1, the Proposed Development site was previously a wind farm site. The previous wind turbines at the site were granted planning permission in 2002 and the site was constructed and became operational in 2006. The turbines were removed in June 2018 as they had reached the end of their productive lifespan. As such, being that there was previous wind energy generation at this site, building the Proposed Development would renew the wind resource at this site.

If the development is not built, the opportunity to capture a significant part of Corks valuable renewable energy resource would be lost, as would 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. Building a wind farm at this location makes use of previous infrastructure on the site and overall maximises the sites resources, for example, existing roads and existing connection into the national grid.

The opportunity to generate local employment and investment would also be lost, and the local economy would continue to rely primarily on agriculture and commercial forestry as the main source of income. It is likely that the trends of population decline and rural deprivation that have been recorded within the Study Area would continue in the absence of investment, as discussed in Chapter 5 of this EIAR on Population and Human Health.

The existing commercial forestry works can and will continue in conjunction with this proposed use of the site.

3.3.3 Alternative Sites/Strategic Site Selection

As the cost of building each megawatt of electricity-generating capacity in a wind farm is in the region of €1.5 million, it is critical that the most suitable site for the Subject Development was chosen.

As set out in Section 1.3 of this EIAR the applicant company, Wingleaf Ltd. is affiliated with Enerco Energy Ltd. which is an Irish-owned Cork-based company with extensive experience in renewable energy and is responsible for projects throughout Ireland. The Company as a whole has over 550MW of renewable energy projects in operation nationally with a further 400MW in its portfolio at various stages of development/approval. All of which urgently need to be provided to assist Ireland in meeting its renewable energy targets. Enerco Energy invests a significant amount of time and resources identifying and investigating sites for renewable energy proposals throughout the Country.

Sites selected for the development of a wind farm must be suitable for consideration under a number of criteria, such as:

- Planning Policy Context;
- Low population density preferred;
- Consistent wind speeds/Aspect;
- Potential for impact on Designated sites;
- Reasonable access to the national electricity grid.

In terms of all five criteria, the site was deemed to be the optimal site for development of a wind farm.

Being that the site was previously used for wind energy generation, the site still includes infrastructure that was part of the previous wind farm and which can be utilised for the Proposed Development, for example, existing access tracks and an existing overhead line connection to the national grid, overall

making the development more environmentally sustainable than it would be to develop on a greenfield site. If the developer was unable to make use of this site, they would envisage the need to develop another (potentially greenfield) site for the Proposed Development as a means of working towards meeting Government and EU targets for climate change on the island of Ireland, which would be unsustainable and could potentially lead to greater environmental impacts or impacts on Natura 2000 sites.

Under the Wind Energy Strategy (WES) within Cork County Development Plan 2014 – 2020, the site of the Proposed Development is located in an area designated 'Open to Consideration'. The presence of the previous wind turbines, which operated successfully and without environmental incident, indicates that the site has potential to accommodate the new proposed development and the conclusions to the various chapters of the EIAR and the accompanying NIS shows that this is the case.

The site is large enough to accommodate a wind farm development that consists of a larger turbine than those previously located on the site, taking into account the separation distances required between turbines and the buffer zones to be maintained around houses and roads etc. in which no turbines could be sited.

3.3.4 Alternative Renewable Energy Technologies

The proposed wind farm will be located on a site where forestry will continue to be carried out around the footprint of the wind farm. Alternative sources of renewable energy considered for the site included solar energy. To achieve the same energy output from solar energy, the site would require a significantly larger development footprint. In addition, a solar development would have a higher potential environmental effect on Hydrology & Hydrogeology, Traffic & Transport (construction phase) and Biodiversity (habitat loss) at the site. Being that the site previously catered for wind turbines, the location is deemed acceptable to wind energy. By continuing to make use of this site for wind, the developer benefits in using existing wind farm infrastructure and reducing their impact on the environment. For this reason, wind energy is considered the most suitable renewable energy option for the site.

3.3.5 Alternative Turbine Numbers and Model

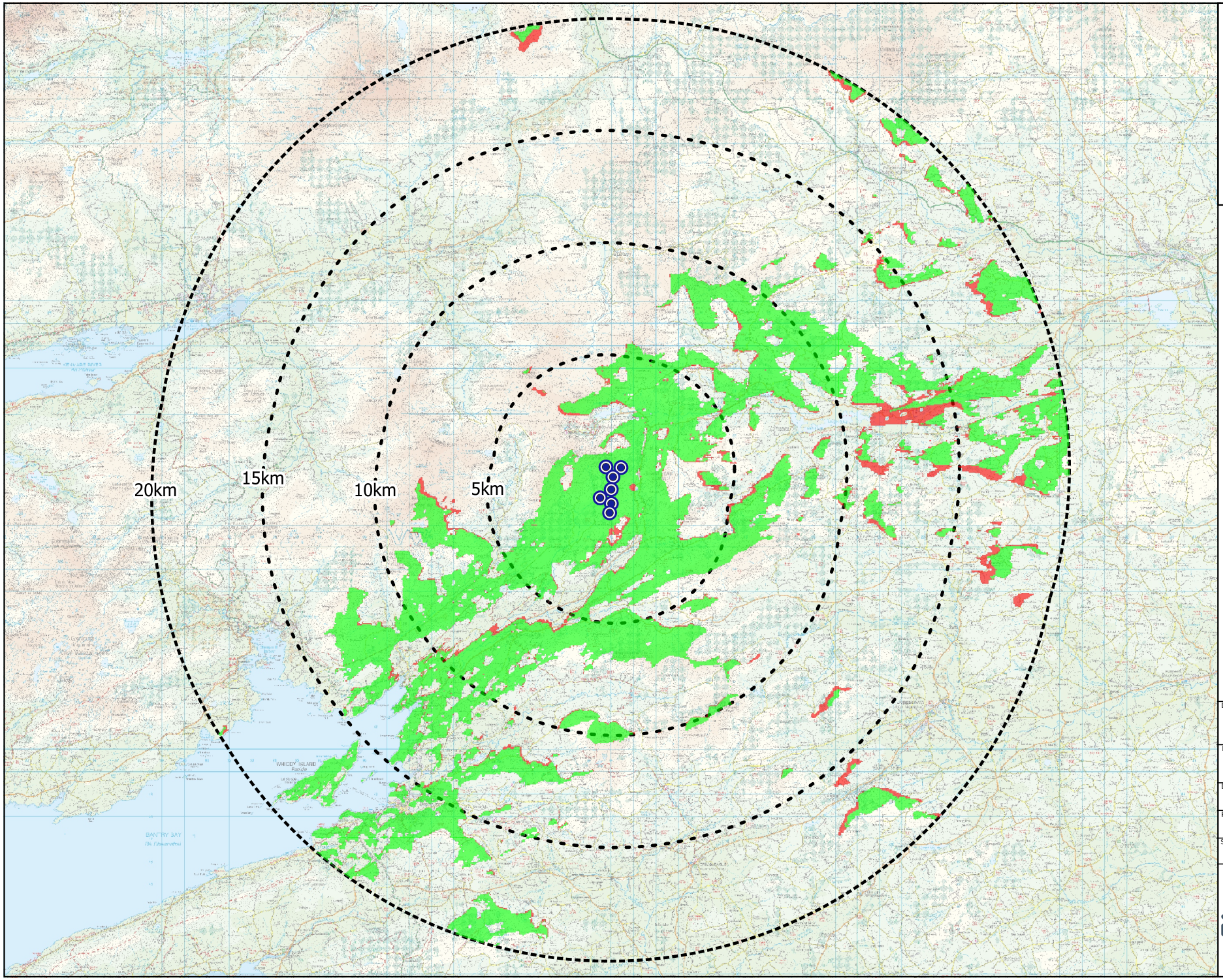
The proposed wind turbines will have a potential power output in the 3 and 5 megawatt (MW) range. It is proposed to install 7 turbines at the site which could achieve approximately 30 MW output. Such a wind farm could also be achieved on the proposed site by using smaller turbines (for example, it would take 35 of the previously installed turbines to generate a 30MW output). However, this would necessitate the installation of over 20 turbines to achieve a similar output. Furthermore, the use of smaller turbines would not make efficient use of the wind resource available having regard to the nature of the site. A larger number of smaller turbines would result in the wind farm occupying a greater footprint, similar to the previous wind turbines that were on this site, with a larger amount of supporting infrastructure being required (i.e. roads etc) and increasing the potential for environmental impacts to occur. The proposed number of turbines takes account of all site constraints and provides ample distance between turbines and features such as roads and houses, while maximising the wind energy potential of the site. The 7-turbine layout selected for the site has the smallest development footprint of the other alternatives considered, while still achieving the optimum output at a more consistent level than would be achievable using different turbines.

The turbine model to be installed on the site will be the subject of a competitive tendering process. The maximum height of the turbines that will be selected for construction on the site will not exceed 178.5 metres when measured from ground level to blade tip. For the purposes of this EIAR a range of turbines within this size envelope has been assessed (e.g. tallest turbine within defined range has been assessed for visual impact). The use of alternative smaller turbines at this site would not be appropriate as they would fail to make the most efficient use of the wind resource passing over the site.

During the initial stages of the application, other turbine heights were considered and it was determined that the environmental impact associated with the proposed turbines i.e. turbines with a ground level to blade tip height of 178.5m, had no additional impact on the environment than those that would occur from a smaller turbine with a ground level to blade tip height of 150m. One of the main similarities noted was the visual impact associated with both turbine models, where the Zone of Theoretical Visibility

(ZTV) for a turbine with a tip height of 150m theoretically has the same visibility has a turbine with a tip height of 178.5m. This can be seen in Figure 3-1.

The EIAR therefore provides a robust assessment of the turbines that could be considered within the overall development description.



Map Legend

Proposed Turbine Locations

Comparative ZTV

150m Tip Height

178.5m Tip Height

N

Drawing Title

Comparative ZTV

Project Title: Curraglass Renewable Energy Development, Co. Cork	
Drawn By: Órla Murphy	Checked By: Michael Watson
Project No.: 190301	Drawing No.: 3-1
Scale: 1:220000	Date: 25.06.2020

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3.3.6 Alternative Turbine Layout and Design

The design of the Proposed Development has been an informed and collaborative process from the outset, involving the designers, developers, engineers, landowners, environmental, hydrological and geotechnical, archaeological specialists and traffic consultants.

Throughout the preparation of the EIAR, the layout of the Proposed Development has been revised and refined to take account of the findings of all site investigations, which have brought the design from its first initial layout to the current proposed layout. The design process has also taken account of the recommendations and comments of the relevant statutory and non-statutory organisations, the local community and local authorities as detailed in Section 2.5 of Chapter 2.

3.3.6.1 Constraints Mapping

The design and layout of the proposed wind energy development follows the recommendations and guidelines set out in the '*Wind Energy Development Guidelines'* (Department of the Environment, Heritage and Local Government, 2006) and the '*Best Practice Guidelines for the Irish Wind Energy Industry*' (Irish Wind Energy Association, 2008). The '*Wind Energy Development Guidelines for Planning Authorities*' (DoEHLG, 2006) are currently the subject of a targeted review. The proposed changes to the assessment of impacts associated with onshore wind energy developments are outlined in the document '*Proposed Revisions to Wind Energy Development Guidelines 2006 – Targeted Review'* (2013) and in the '*Review of the Wind Energy Development Guidelines 2006 – Preferred Draft Approach'* (June 2017).

In December 2019, the Department of Housing, Planning and Local Government published the *Draft Wind Energy Guidelines* (referred to as the Draft Revised Guidelines) and these Draft Guidelines were under public consultation (until 19th February 2020). The design of the Proposed Development has taken account of the "preferred draft approach" as articulated by the Department in June 2017, and accordingly, has been developed with the provisions of the current Draft guidelines in mind.

The constraints mapping process involves the placing of buffers around different types of constraints so as to identify clearly the areas within which no development works will take place. The size of the buffer zone for each constraint has been assigned using guidance presented in the Department of the Environment, Heritage and Local Government Wind Energy Guidelines (DoEHLG, 2006). As it is a possibility that that the new guidelines will be issued during the application process timeframe, current proposed changes have been incorporated into the design.

The constraints map for the site, as shown in Figure 3-2, was produced following a desk study of all site constraints.

- Residential dwellings plus a minimum 500-metre buffer (the actual closest house is 760m away, exceeding the current 500m guidance):
- Natura 2000 sites plus 200-metre buffer;
- Telecommunication Links plus operator specific buffer;
- Watercourses plus 50-metre buffer;
- Archaeological Sites or Monuments, 50-metre buffer, plus 'Zone of Notification' as required by the National Monuments Service (ROI).

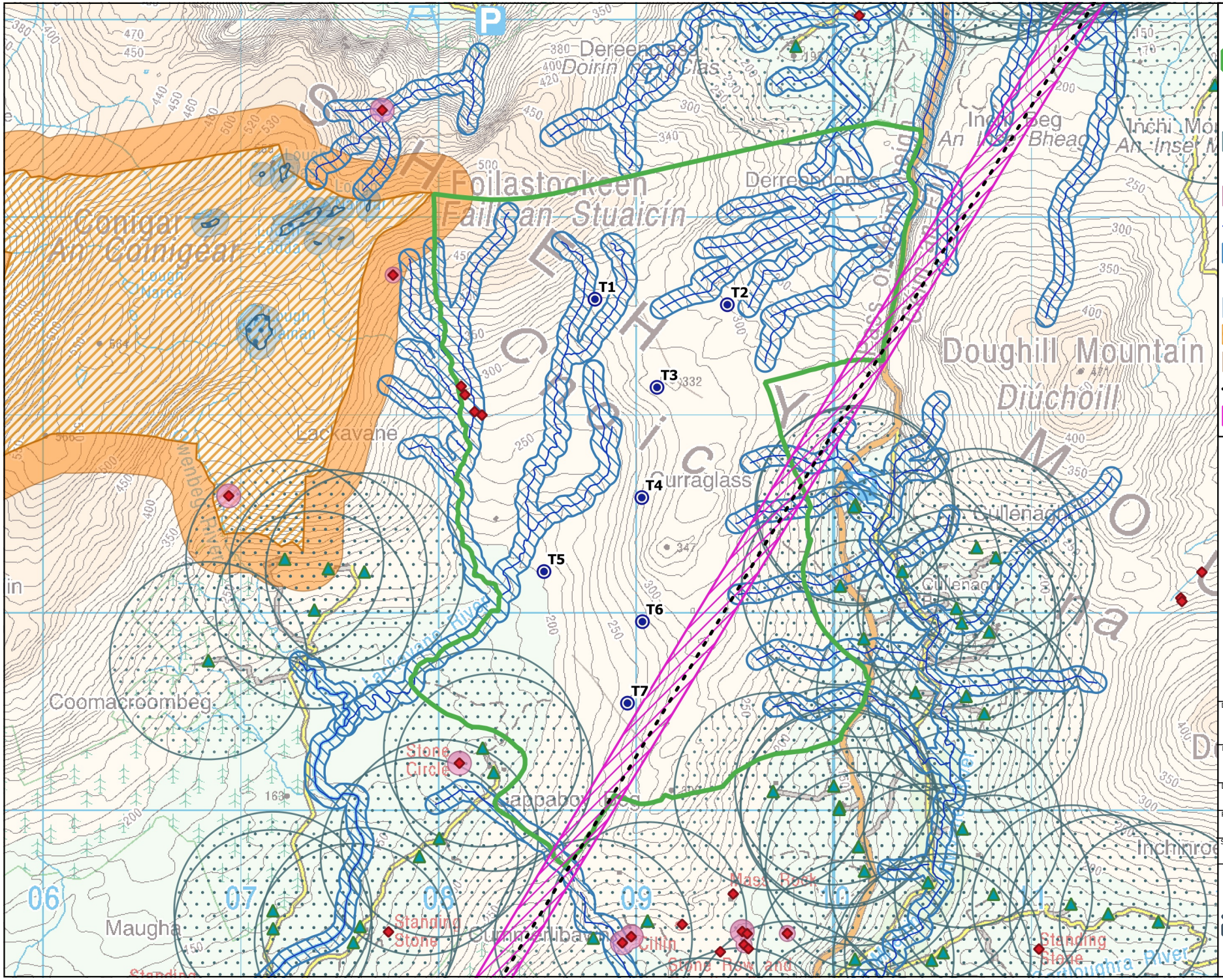
Facilitators at the site build on the existing advantages and include the following:

- Available lands for development;
- Separation distance from third-party dwellings;
- Proximity to suitable grid connection;
- Good wind resource;
- Existing access points and onsite road infrastructure of all areas of the site due to commercial forestry activities and the previous operational wind farm.
- Limited extent of constraints as detailed above.

The inclusion of the constraints on a map of the study area allows for a viable area to be identified. An initial turbine layout is then developed to take account of all the constraints mentioned above and their associated buffer zones and the separation distance required between the turbines.

Following the mapping of all known constraints, detailed site investigations were carried out. These investigations included habitat mapping and ecological surveying of the site and also hydrological and geotechnical investigations of the site of the Proposed Development.

Following the initial constraints mapping, where specific areas were deemed to be sensitive to the Proposed Development for any reason the project design/layout was further amended and circulated to all members of the project team so that the final design has been reviewed in full and potential impacts assessed.



Map Legend

- EIAR Site Boundary
- Proposed Turbine Locations
- Dwellings
- Dwelling Buffer - 500m
- National Monuments
- Sites and Monuments Record - Zones of Notification
- Watercourse
- Watercourse Buffer (50m)
- Lakes
- Lakes Buffer (50m)
- Natural Heritage Area (NHA)
- NHA Buffer (200m)
- RTE 2rn - Link
- RTE Fresnal Zone DTT

N

Drawing Title

Constraints and Facilitators

Project Title

Curraglass Renewable Energy Development, Co. Cork

Drawn By	Checked By
Órla Murphy	Michael Watson
Project No.	Figure No.
190301	3-2
Scale	Date
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3.3.6.2 Turbine Layout

The final proposed turbine layout takes account of all site constraints and the distances to be maintained between turbines and from houses, roads, etc. The layout is based on the results of all site investigations that have been carried out during the EIAR process. As information regarding the site of the Proposed Development was compiled and assessed and the proposed layout has been revised and amended to take account of the physical constraints of the site and the requirement for buffer zones and other areas in which no turbines could be located. The selection of turbine number and layout has also had regard to wind-take, noise and shadow flicker impacts. The EIAR and wind farm design was an iterative process, where findings at each stage of the assessment were used to further refine the design, always with the intention of minimising the potential for environmental impacts.

The development of the final proposed wind farm layout has resulted following feedback from the various studies and assessments carried out.

During the optimisation of the site layout, there were several reviews of the specific locations and number of turbines proposed for the development. Initially, a 10-turbine layout was considered as a replacement for the 10-turbine development that was previously operational on the site (see Plate 3-1 below).

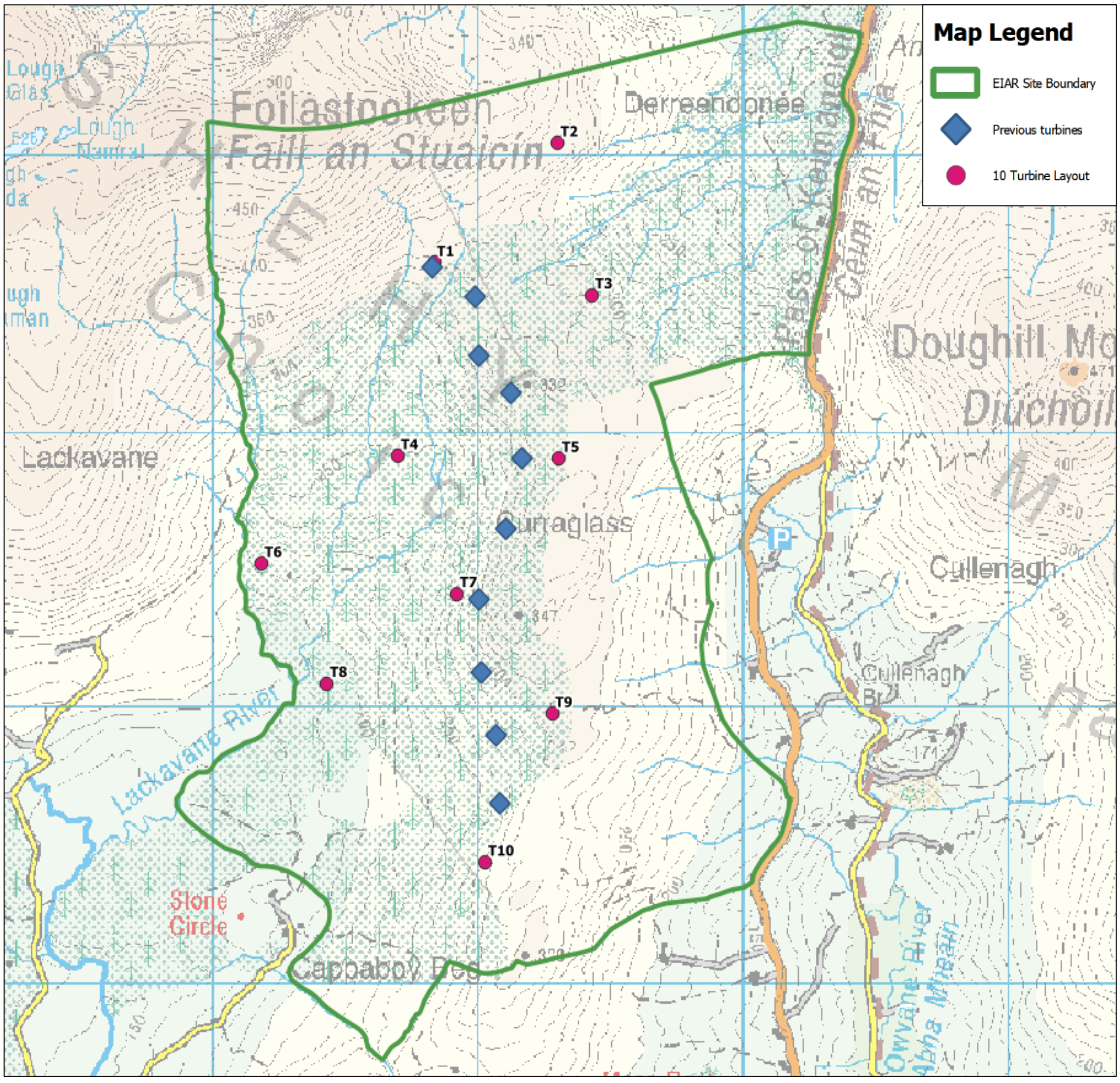


Plate 3-1 Initial 10-turbine layout

This initial 10-turbine layout identified a significant viable area within the overall study area. Based on feedback from the design team, it was determined that it would be more efficient to allow for fewer turbines and a larger turbine model at the site.

It was also considered more favourable to make use of the existing infrastructure on site, specifically access roads and previous turbine locations. From this, further analyse was completed, which considered the above and took into account locations with the most available wind resource. This led to a reduction in turbine numbers, with an 8-turbine layout proposed (see Plate 3-2).

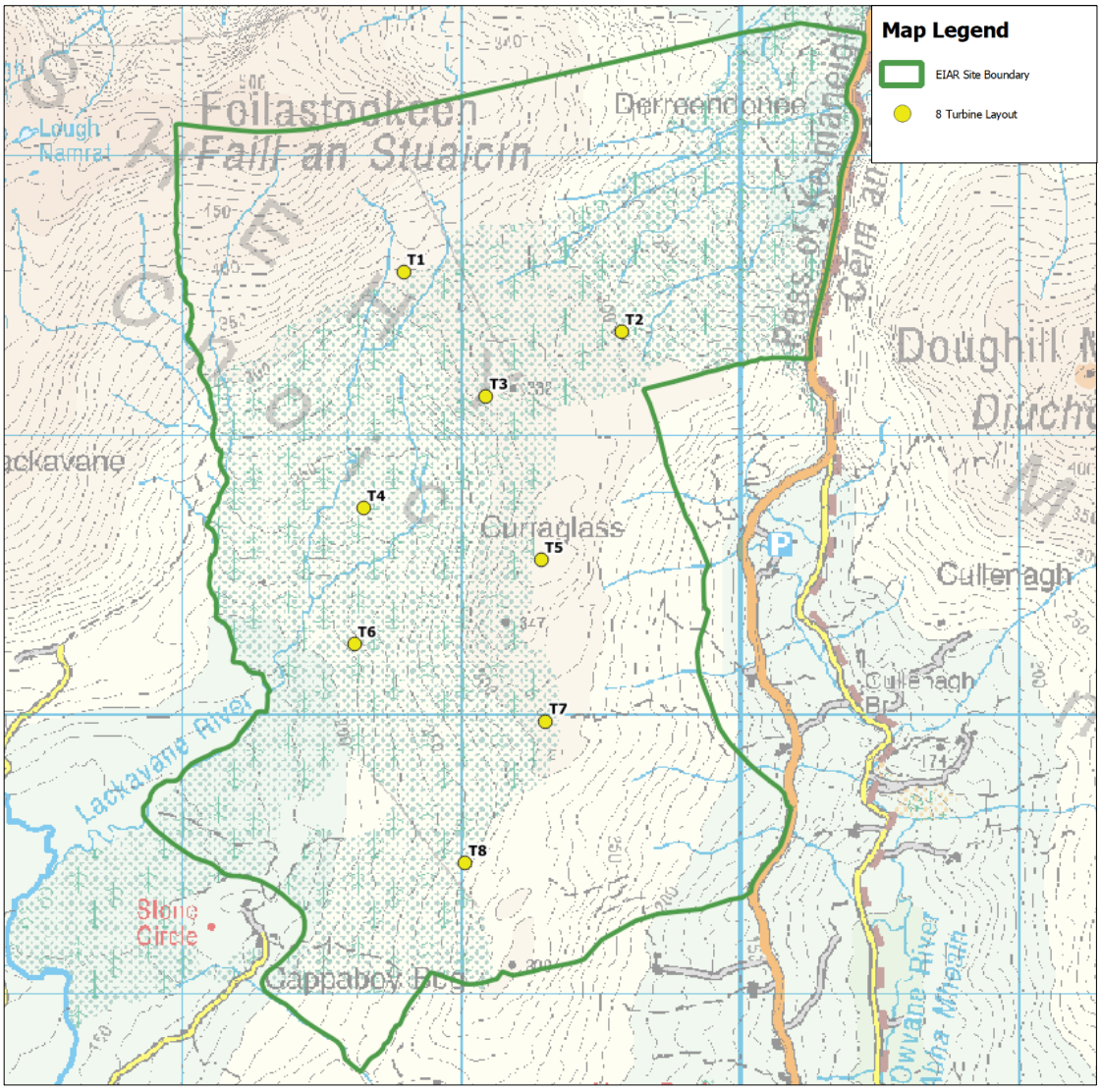


Plate 3-2: 8-turbine layout

On review of the above layout, the project team provided feedback from their site visits. The turbine layout and study area were updated to address any on-site issues not identified during the desk-based assessment, which led to a proposed 7-turbine layout as seen in Plate 3-3 below.

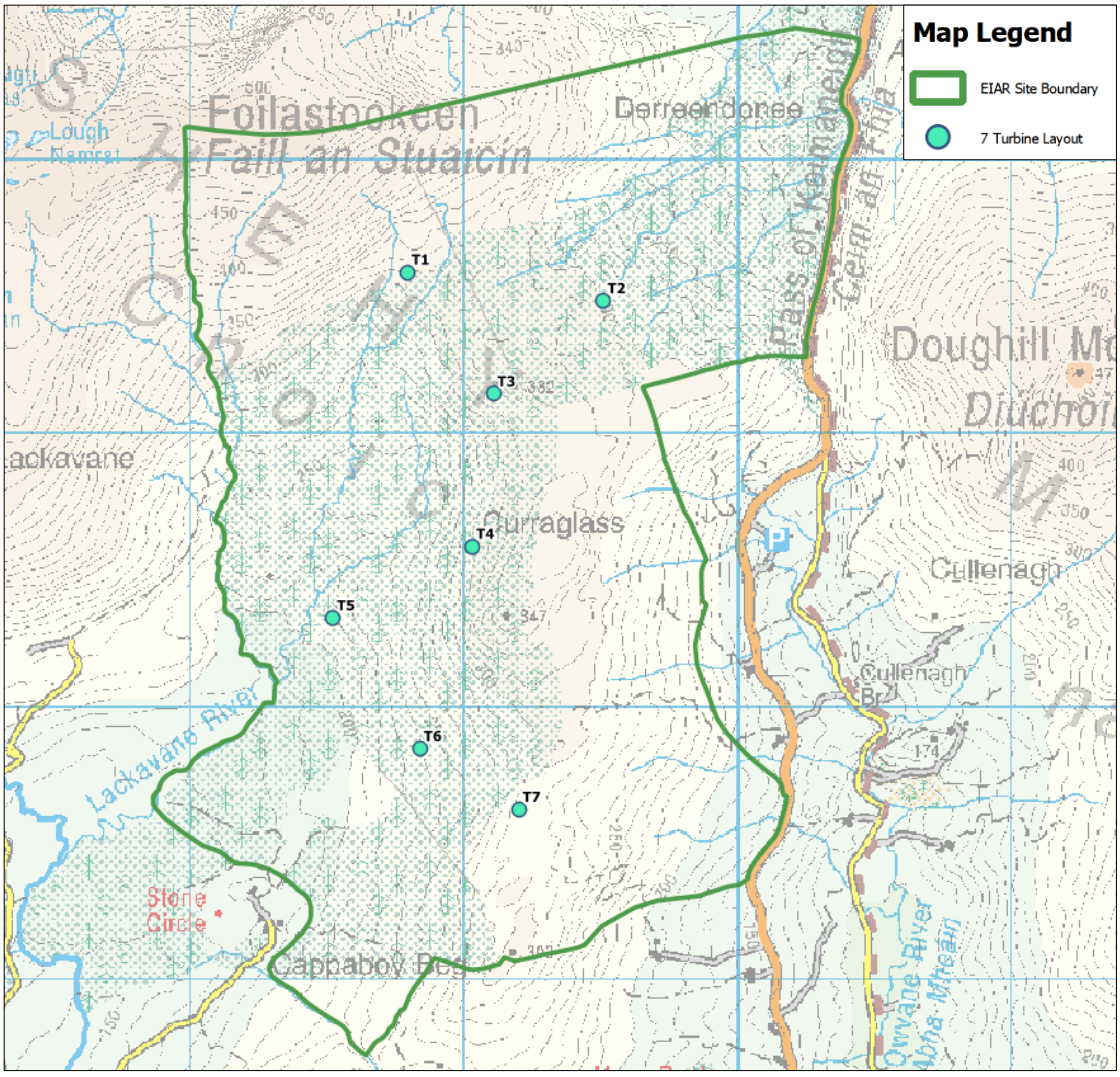


Plate 3-3 Initial 7-turbine layout

During finalisation of the above layout, the applicant received notification from operators of additional telecommunications links within the study area. To ensure sufficient separation distances were maintained; turbines were moved within the south eastern area of the site. The chosen turbine layout, as seen in Plate 3-4 is considered optimal, making use of the previous turbine infrastructure and reducing potential for greater environmental effects.

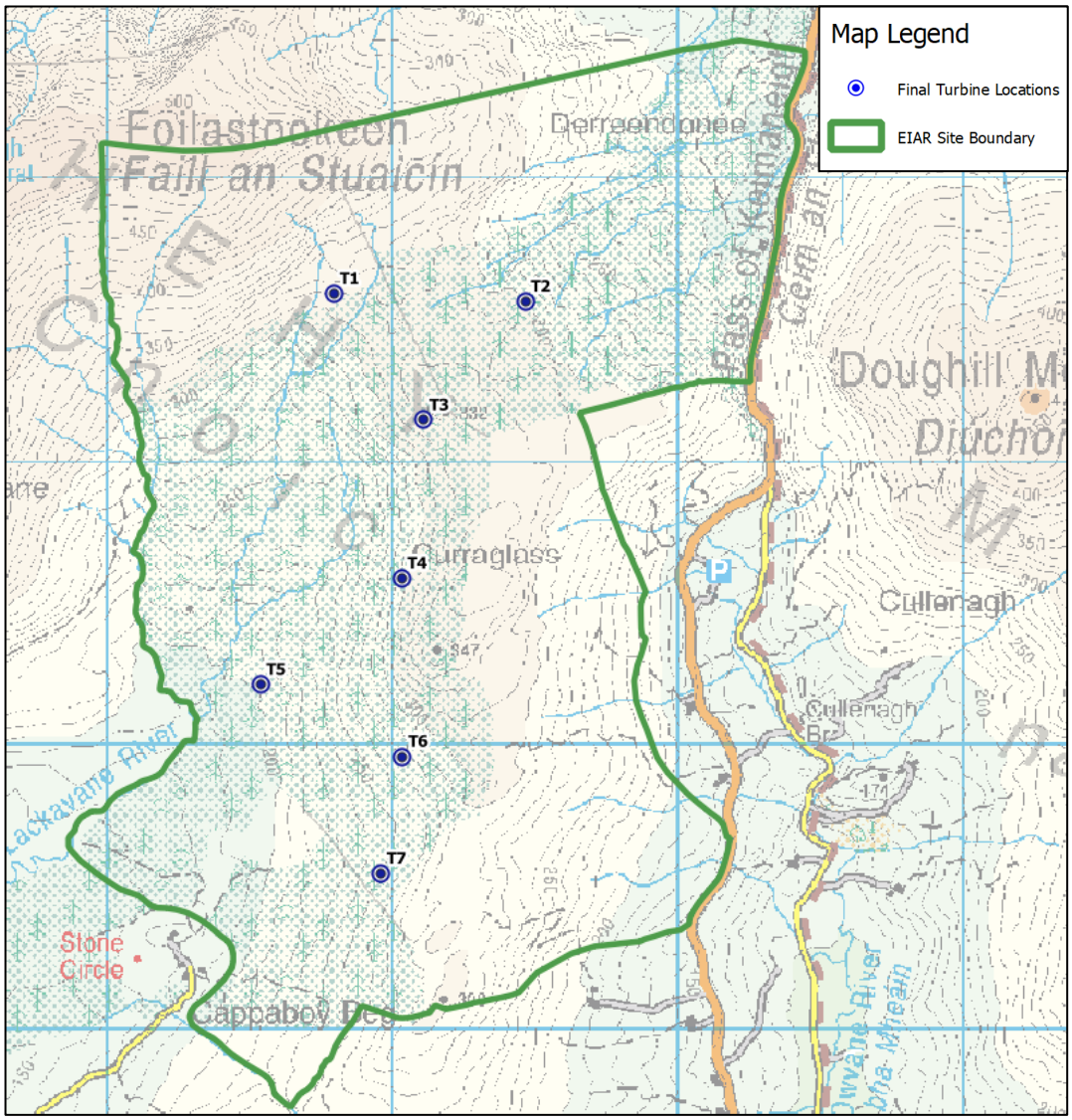


Plate 3-4 Final Turbine Locations

3.3.6.3 Other Infrastructure

As a result of the constraints study and desk-based assessment, an initial layout, as per Figure 3-3. This was constrained further during the site process as detailed below, with the final layout shown in Figure 3-4.

3.3.6.3.1 *Road Layout*

Access tracks are required onsite in order to enable transport of infrastructure and construction materials within the Proposed Development. Such tracks must be of a gradient and width sufficient to allow safe movement of equipment and vehicles. Being that there were turbines on this site previously, the applicant is able to avail of and make use of the existing access tracks where available to minimise the potential for impacts by using new roads as an alternative.

As the overall site layout was finalised, the most suitable routes between each component of the development were identified, taking into account the existing roads and the physical constraints of the site. Locations were identified where upgrading of the existing road would be required and where new roads are to be constructed, in order to ensure suitable access to and linkages between the various project elements, and efficient movement around the site (see Figure 3-4).

An alternative option to making maximum use of the existing road network within the site would be to construct a new road network, having no regard to existing roads or tracks. This approach was deemed less desirable, as it would require unnecessary disturbance to the site and create the potential for additional environmental impacts to occur.

3.3.6.4 Location of Ancillary Infrastructure

The ancillary structures required for the Proposed Development include construction compound, electricity substation and associated cabling and borrow pits.

3.3.6.4.1 *Construction Compound*

One proposed temporary construction compound is proposed for the storage of all construction materials. The construction compound is located towards the north of the site as seen in Figure 3-4 and accessed via the proposed internal road network.

Siting the temporary compound along the existing tracks will result in less disturbances to the site and a reduced visual impact arising from the development. The alternative option of using multiple temporary construction compounds rather than the one large compound proposed was not considered to be a viable alternative given the scale of the development

3.3.6.4.2 *Electricity Substation and Grid Connection*

The planning application includes for the connection to the national grid via 1 no. proposed substation and associated grid connection option in the townland of Curraglass and will ultimately be constructed as described in Section 1.4 of this EIAR. This substation and grid connection has been assessed within the EIAR.

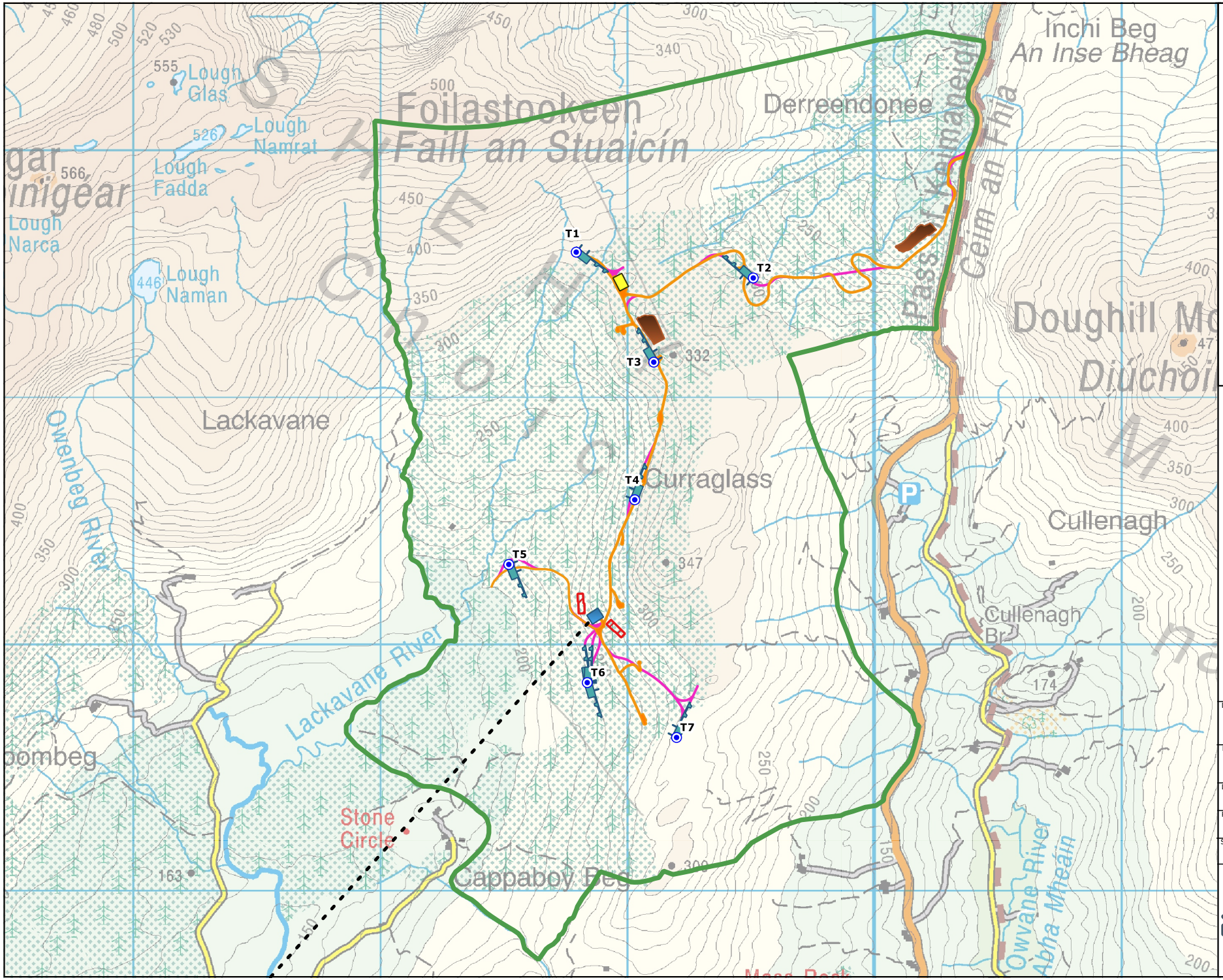
The Proposed Development will connect to the existing 38kV overhead line within the site, which connects into Ballylickey Substation, located approximately 12 kilometres southwest of the site. Any alternative to this has the potential for greater environmental effects and so this is the chosen option.

The location selected for the proposed substation has had regard to the constraints of the site. Initially, there were two substation options as seen in Figure 3-3. Ease of access, proximity to the existing grid connection and minimising distance from turbines were taken into consideration. On conclusion of the site visits, the location directly northwest of the existing substation was selected as seen in Figure 3-4.

3.3.6.4.3 *Borrow Pit*

Material required for the construction of onsite infrastructure will be obtained from two borrow pits onsite as shown on Figure 3-4. Borrow Pit 1 is located approximately 70 metres northeast of Turbine No. 3 and Borrow Pit 2 is located further south within the site, approximately 180 metres north of Turbine No. 6. The use of borrow pits represents an efficient use of existing onsite resources and eliminates the need to transport large volumes of construction materials along the local public road network to the site. The locations for the borrow pits were chosen considering the site characteristics, including topography, ground conditions and surface water features. Both borrow pits were also placed according to habitat, with their proposed locations being in that of forestry, avoiding any peatland habitats.

Different borrow pits locations were initially proposed for the wind development as seen below in Figure 3-3. A borrow pit area was also investigated in the eastern section of the site, along the access road. However, it was identified during the assessment of borrow pit options that the location of this particular borrow pit was would cause difficulty during construction and would require excessive loading to gain better access to the site and the proposed turbine locations.



Map Legend

- EIAR Site Boundary
- Proposed Turbines Locations
- Existing Roads - Upgrade Proposed
- Proposed New Site Roads
- Current Substation Location
- Existing Overhead Line to Ballylickey
- Proposed Temporary Compound Location
- Proposed Hardstanding
- Proposed Substation Location Options
- Proposed Borrow Pit Locations

N

Drawing Title

Initial Site Layout

Project Title: Curraglass Renewable Energy Development, Co. Cork	
Drawn By: Órla Murphy	Checked By: Michael Watson
Project No.: 190301	Drawing No.: Figure 3-3
Scale: 1:20000	Date: 18.06.2020

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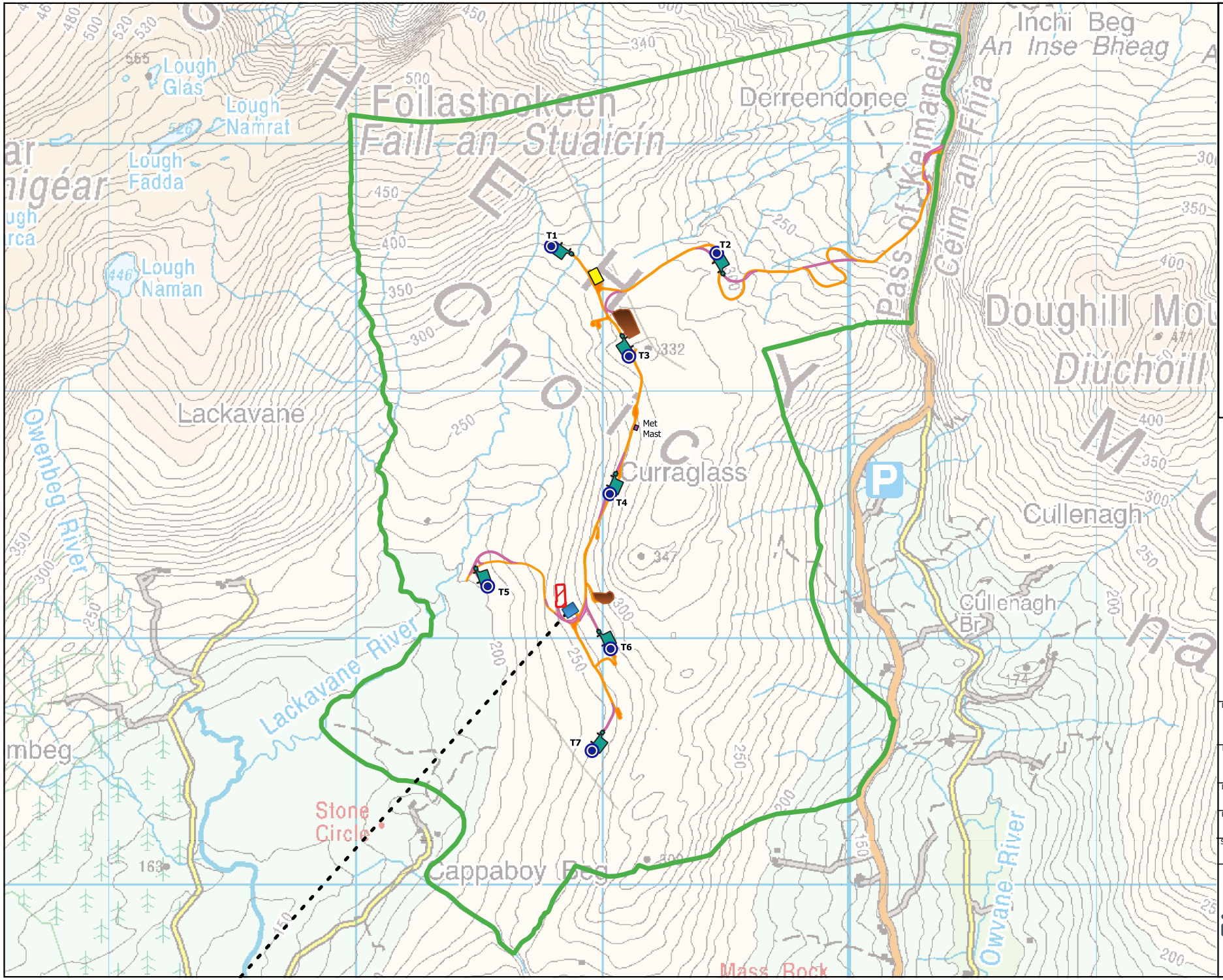

Map Legend

- EIAR Site Boundary
- Proposed Turbine Locations
- Existing Roads - Upgrade Proposed
- Proposed New Site Roads
- Current Substation Location
- Existing Overhead Line to Ballylickey
- Proposed Temporary Construction Compound
- Proposed Hardstanding
- Proposed Substation
- Proposed Borrow Pits
- Proposed Met Mast Location

N

Drawing Title

Final Site Layout

Project Title: Curraglass Renewable Energy Development, Co. Cork	
Drawn By: Órla Murphy	Checked By: Michael Watson
Project No.: 190301	Drawing No.: 3-4
Scale: 1:20000	Date: 19.06.2020

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3.3.7 Alternative Transport Route and Site Access

Wind turbine components (blades, nacelles and towers) are not manufactured in Ireland and therefore must be imported from overseas and transported overland to the site of a Proposed Development. With regard to the selection of a transport route to the Proposed Development site, alternatives were considered in relation to turbine components, general construction-related traffic, and site access locations.

3.3.7.1 Delivery to Site

In assessing the most suitable route for turbine transport, several routes were considered:

- Access from Ringaskiddy Port via Bandon, Clonakilty and Bantry, utilising the N71, before accessing the site via the R584, passing through Kealkill village;
- Access from Ringaskiddy Port via the N22 passing through Crookstown and Kealkill; and
- Access from Ringaskiddy Port via the N22 from Macroom, passing through Lissacresig and Ballingeary;

Option 1 is the preferred turbine delivery route via the N22 from Ringaskiddy Port via Crookstown. This route would see turbine deliveries travel via Crookstown along the R585 Regional Road to the junction with the R584 Regional Road in the village of Kealkill. From Kealkill, the turbine delivery route will continue on the R584 to Ballylickey, where a reversing manoeuvre occurs at Ballylickey bridge. Once the manoeuvre is complete, the turbines will travel north east back along the R584, through Kealkill towards Ballingeary. The turbines will then travel past the site entrance, making a turn further along the R584, before travelling back south along the same road and accessing the site from the north via the existing Coillte entrance.

Option 2 is also considered as an alternative route within the EIAR. This option follows the same route as Option 1, but the delivery vehicles will continue on the N22, through Macroom before making a turn at west at Lissacresig along the L-3402 to Ballingeary. From here the delivery vehicles will travel west along the R584 accessing the site from the north via the existing Coillte entrance. A review has been completed for this route in Chapter 14, Section 14.1.8, showing that it would be feasible for turbines to travel along this route.

These routes have been proven suitable for the transport of turbine components, and the updated transport analysis (as presented in Section 14.1 of this EIAR), shows that only minor accommodation works will be required to accommodate the proposed turbines. The turbine transport route will utilise the national and primary roads available to ensure the road network holds the capacity to manage large loads. When considering turbines transport routes, alternative routes comprising of a more direct route with greater stretches of secondary and local roads were considered less optimal due to the increased possibility of road and roadside disruption and a greater need to carry out works.

All construction traffic will use the designated haul routes only. An alternative to this would be to allow for more direct access to the site using multiple approach routes; however, this is more likely to give rise to additional traffic and road impacts.

Turbines will be delivered to site using a Super Wing Carrier as detailed in Section 14.1 of this EIAR. When considering turbines transport routes, alternative modes of transport were also considered. Alternatively, depending on the selected turbine delivery route and the turbine manufacturer, a blade transporter may also be used, if deemed appropriate, for delivery of turbines to the Proposed Development site.

3.3.8 Alternative Mitigation Measures

Mitigation by avoidance has been a key aspect of the proposed project's evolution through the selection and design process. Avoidance of the most ecologically sensitive areas of the site limits the potential for environmental effects. As noted above, the site layout aims to make use of existing onsite infrastructure

which assists in avoiding any environmentally sensitive areas. Any forestry felled within the footprint of the site will be replaced offsite, with no net loss. The alternative to this approach is to encroach on the environmentally sensitive areas of the site and accept the potential environmental effects and risk associated with this.

The best practice design and mitigation measures set out in this EIAR will contribute to reducing any risks and have been designed to break the pathway between the site and any identified environmental receptors. The alternative is to either not propose these measures or propose measures which are not best practice and effective and neither of these options is sustainable.