Mullaghclogher Wind Farm

Environmental Statement

Volume 1 - Non-Technical Summary



power for good

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Preface

This document is Volume 1 of the Environmental Statement (ES) for Mullaghclogher Wind Farm. The ES comprises:

- **Volume 1: Non-Technical Summary (NTS)**
- **Volume 2: Main Report**
- **Volume 3: Figures (Maps & Illustrations)**
- **Volume 4: Technical Appendices**

The aim of the NTS is to summarise the content and main findings of the ES in a clear and concise manner to assist the public in understanding what the environmental effects of the Mullaghclogher Wind Farm are likely to be. The full ES provides a more detailed description of the Proposed Development and the findings of the Environmental Impact Assessment (EIA) process.

The ES has been prepared by RES in consultation with Department of Infrastructure (Planning), various consultees and in collaboration with the subject specialists outlined below.

Specialism	Author
Introduction & the Proposed Development Design Evolution & Alternatives Noise Traffic & Transport Shadow Flicker	RES
Planning Policy	Savills
Landscape & Visual	Shanti McAllister Landscape Planning & Design
Archaeology & Cultural Heritage	Landgage Archaeology
Vegetation & Peatland	Blackstaff Ecology
Terrestrial Fauna	Blackstaff Ecology
Ornithology	David Steele
Fisheries & Aquatic Ecology	Paul Johnston Associates
Geology & Water Environment	McCloy Consulting
Peat Slide Risk & Peat Management Plan	SLR
Socioeconomics	Oxford Economics

Commenting on the ES

The full ES, together with supporting documents submitted as part of the planning application, (including the Design & Access Statement and Pre-Application Community Consultation Report) will be available for viewing during normal opening hours at the address below. Electronic copies (USB memory stick) will be available free of charge.

Aughabrack & District Community Association
253 Lisnaragh Road,
Dunamanagh,
Strabane,
Northern Ireland,
BT82 0SD

An electronic version of the ES, and documents supporting the planning application, will be available to download free of charge from https://www.mullaghclogher-windfarm.co.uk/

Electronic (USB memory stick) and paper copies will also be available on request, from the address below and above. A fee of £300 will be applicable to obtain a paper copy of these documents, please contact RES in advance of making a purchase.

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Introduction

This Non-Technical Summary (NTS) has been prepared in support of a planning application by RES Ltd for the proposed Mullaghclogher Wind Farm, hereinafter referred to as 'the Proposed Development', which is located in the townlands of Carrickayne, Legnahappoge, Glengarrow, Stroanback and Doorat, 4KM North East of Plumbridge, Northern Ireland.

A planning application has been submitted to Department of Infrastructure (Strategic Planning Directorate) in accordance with the Planning (Environmental Impact Assessment) Regulations, 2017. The regulations require an EIA to be carried out and the results of the EIA to be included in an Environmental Statement (ES) to accompany the planning application. The application follows a detailed assessment of the environmental and technical aspects of the site's suitability for development.

The Proposed Development comprises up to 11 three-bladed horizontal axis wind turbines, each up to 180 m maximum tip height; associated external electricity transformers; underground cabling; access tracks; turning heads; crane hardstandings; control building and substation compound, battery energy storage containers, off-site areas of widening to the public road and all ancillary works. During construction and commissioning there would be a number of temporary works including a construction compound with car parking; temporary parts of crane hardstandings; welfare facilities. The purpose of the development is for the generation of electricity.

The location of the Proposed Development is shown on Figure 1: Site Location.

The Applicant

RES is the world's largest independent renewable energy company, working across 24 countries and active in wind, solar, energy storage, green hydrogen, transmission and distribution. As an industry innovator for over 40 years, RES has delivered more than 27GW of renewable energy projects across the globe and supports an operational asset portfolio exceeding 41GW worldwide for a large client base. RES has developed 29 onshore wind farms in Northern Ireland totalling in excess of 500MW and operates over 150MW of wind capacity across Northern Ireland including the Craiggore and Evishagaran Wind Farms in Co. Derry/Londonderry, constructed in 2022, and Murley Mountain Wind Farm, Co. Tyrone more recently completed in 2024.

The Application Site

There are a number of key technical and environmental factors that influence the suitability of a site for a wind farm. The following are key attributes that contribute to a viable site, which the application site possesses:

- **Wind Speeds/Energy Yields**: Sufficiently high wind speeds to ensure energy production from the wind turbines that would yield an adequate return on investment;

- **Planning**: A site which complies with planning policy and in particular, avoids unacceptable effects on areas designated by statutory agencies; maintains appropriate distances from dwellings to avoid unduly impacting local amenity and; avoids impeding or interfering with major electromagnetic transmission and airport communication systems;
- **Area of Site**: A site must have sufficient area to accommodate the number of wind turbines required for economic viability;
- **Access**: Adequate vehicular access to a site using existing roads wherever possible to minimise the amount of civil works, particularly during the construction phase;
- **Local Terrain and Topography**: Terrain and topography affect wind flow across a site and need to be considered in relation to turbine performance, specification and life-span;
- **Ground Conditions**: A site must have suitable ground conditions for the construction of wind turbine foundations, erection of the machines and the provision of access tracks and cables.

The Proposed Development comprises 11 three-bladed turbines each up to 180 m maximum blade tip height. It would be located in the townlands of Carrickayne, Legnahappoge, Glengarrow, Stroanbrack and Doorat, approximately 4 km to the northeast of Plumbridge, Northen Ireland. The site is located in the central western part of the Sperrin Area of Outstanding Natural Beauty (AONB) on upland grazing land. The site is currently used for rough grazing of sheep and cattle.

The Need for the Development

Climate Change

The Paris Agreement establishes a framework for global climate action including the mitigation of and adaption to climate change, support for developing nations and the transparent reporting and strengthening of climate goals. The European Union signed The United Kingdom of Great Britain and Northern Ireland up to the Agreement on 22 April 2016 and it came into force on the 18 December 2016.

COP26

The 26th UN Climate Change Conference of the Parties (COP26) took place in Glasgow on 21 October – 12 November 2021, attended by the countries that signed the United Nations Framework Convention on Climate Change. At COP 26, Nations adopted the Glasgow Climate Pact, aiming to turn the 2020s into a decade of climate action and support. Key outcomes included strengthened efforts to build resilience to climate change, to curb greenhouse gas emissions and to provide the required necessary finance. Nations reaffirmed their duty to fulfil the pledge of providing $100 billion annually to developing countries. They collectively agreed

to reduce the gap between existing emission reduction plans and what is required to reduce emissions in order to limit the rise in the global average to 1.5 degrees. Nations were called upon to phase down unabated coal power and inefficient subsidies for fossil fuels.

As part of the package of decisions, nations also completed the Paris Agreement's rulebook relating to market mechanisms and non-market approaches and the transparent reporting of climate actions. This set of rules lays out how countries are held accountable for delivering on their climate action promises and self-set targets under their Nationally Determined Contributions (NDCs). At COP26, Nations reached new agreements for market mechanisms, essentially supporting the transfer of emission reductions between countries while also incentivising the private sector to invest in climate-friendly solutions.

Strategic Energy Review

The Strategic Energy Review was first published in 2007 to establish a core energy policy for all of Europe (Commission of the European Communities, 2007). An agenda was agreed in order to achieve the key energy objectives of:

- Sustainability;
- Competitiveness and security of supply;
- Reducing greenhouse gas emissions by 20%;
- Obtaining 20% of energy consumed from renewable energy sources; and
- Improving energy efficiency by 20%.

The Review was updated in 2008 (Commission of the European Communities, 2008), in order to propose an Energy Security and Solidarity Action Plan, which focused on diversification of energy supply, energy efficiency and making the best of the European Union's indigenous energy resources.

Development of renewable energy reserves, including wind, solar, hydro, marine and biomass energy are seen as the main sources of indigenous energy.

The Energy Road Map 2050

The Road Map (Commission of the European Communities) sets out a long-term vision for renewable energy sources in the European Union and it forms an integral part of the Strategic European Energy Review. The Energy Roadmap 2050 sets out the transition and cost effective pathways for key economic sectors for achieving an 80-95% reduction in EU emissions by 2050. To achieve this goal, significant investment is needed in new low-carbon technologies and infrastructure, energy efficiency and renewable energy.

The 2050 target will not be shifted into national targets via EU legislation but allows more flexibility for Member Countries to meet their greenhouse gas emission reduction targets in the most cost effective method with regard to their own specific circumstances.

Security of Supply

A key policy driver for the development of renewable energy in Northern Ireland is the need to increase security of supply. There are potential adverse impacts on people and the economy

in Northern Ireland through high volatile fuel costs, contributing to fuel poverty and high energy costs for businesses and industry. In addition, increasing focus on renewable energy can deliver environmental and climate change gains, reductions in carbon emissions, as well as investment and employment opportunities. With a lack of indigenous fossil fuels and no nuclear power stations, Northern Ireland is keen to develop the full range of its available renewable energy resources to optimise the contribution that renewables make to the overall energy mix.

Wind is a free and inexhaustible resource which has an important role to play as part of a balanced energy mix. Wind energy enables us to generate our own electricity without reliance on imports and is not subject to sudden price fluctuations or the uncertainty of global markets. New onshore wind is now the cheapest source of electricity generation bar none. This makes onshore wind developments not only beneficial for the environment but also for bill payers in Northern Ireland.

The Proposed Development will result in a reduction in greenhouse gas emissions from the electricity generating industry by harnessing wind as an alternative to the burning of fossil fuels, in line with the government's energy goals. It is also important to highlight that energy production is not static and additional renewable generation will be required to be connected to maintain the Northern Ireland targets and subsequently achieve and maintain the UK renewable targets.

Northern Ireland Energy Strategy

The Department for the Economy published the new Energy Strategy – The Path to Net Zero Energy - in December 2021. It outlines a roadmap to 2030 aiming to deliver a 56% reduction in energy-related emissions, on the pathway to deliver the 2050 vision of net zero carbon and affordable energy. The Energy Strategy sets three main targets to drive these changes including delivering energy savings of 25% from buildings and industry by 2030; doubling the size of the low carbon and renewable energy economy to a turnover of more than £2bn by 2030; and meeting at least 70% of electricity consumption from a diverse mix of renewable sources by 2030. Such provisions would be in alignment with the Republic of Ireland's aim of 70% renewable electricity by 2030 as set out within the Region's Renewable Electricity Support Scheme (RESS). The Energy Strategy recognises that meeting this 70% target likely means doubling renewable energy capacity in order to meet new demands from heating our homes and powering our vehicles The Renewable Energy target for Northern Ireland is 70% increasing to 80% by 2030 as per the Climate Change Act (Northern Ireland) 2022.

In addition, other relevant frameworks and reference points apply, including the Climate Change Act 2008, under which the UK committed itself to reducing greenhouse gas emissions by at least 80% of 1990 levels by 2050. Included in this target is the reduction of emissions from the devolved administrations, including Northern Ireland.

Description of the Development

Planning permission is being sought for the Proposed Development comprising the following:

- Up to 11 three-bladed horizontal axis wind turbines of up to 180 m tip-height

- Associated external electricity transformers
- Upgrades to an existing site entrance
- New access tracks
- Turning heads
- Control buildings and substation compound
- Battery energy storage containers and associated infrastructure
- Off-site areas of widening to the public road and all ancillary works
- Turbine foundations
- Hardstanding areas at each turbine location for use by cranes erecting and maintaining the turbines
- Electricity transformers
- Approximately 9.4 km of new access track
- On-site electrical, control and communications network of underground (buried) cables
- Temporary construction compound
- Permanent and temporary drainage works
- Associated ancillary works

The wind farm layout is shown in **Figure 2: Infrastructure Layout**.

Land take

The turbines need to be spaced a suitable distance apart (taking into account the prevailing wind direction), so as not to interfere aerodynamically with one another. However, the actual land developed is limited to the substation, wind turbine towers, transformers, crane hardstandings, battery energy storage hardstanding and the access tracks. The actual land developed totals 7.89hectares of permanent hardstanding and 0.29 hectares of temporary hardstanding used during construction and reinstated following construction. This permanent hardstanding accounts for approximately 6.7% of the total area within the Planning Application Boundary.

Micrositing

Prior to construction, the infrastructure would be subject to micrositing, which allows for a small degree of flexibility in the exact locations of turbines and routes of tracks and associated infrastructure (50 m deviation in plan from the indicative design). Any repositioning would not encroach into environmentally constrained areas. Therefore, 50 m flexibility would help mitigate any potential environmental effects: e.g. avoidance of unfavourable ground conditions or archaeological features not apparent from current records. The micrositing allowance has been taken into account in the EIA and is shown on **Figure 2: Infrastructure Layout**.

Wind Turbines

The wind turbine industry is evolving at a remarkable rate. Designs continue to improve technically and economically. The most suitable turbine model for a particular location can change with time and therefore a final choice of machine for the Proposed Development has not yet been made. The most suitable machine will be selected before construction, with a maximum tip height of up to 180 m.

Exact tower and blade dimensions vary marginally between manufacturers. Exact megawatt capacities also vary between manufacturers. For economic assessment purposes, a suitable candidate turbine currently available in the market place of 6 MW (with an overall tip height of 180 m) has been assumed.

Each turbine would have a transformer and switchgear. Depending on the turbine supplier, the transformer and switchgear may be located inside or outside each turbine.

The wind turbines would be erected on steel re-enforced concrete foundations. During the erection of the turbines, crane hardstanding areas would be required at each turbine base consisting of both permanent and temporary elements. After construction is complete, the temporary crane pad areas will be reinstated.

Site Tracks

The site entrance for the Proposed Development is on the Carrickayne road.

The construction of 9.4km of new site tracks will be used to access the site to both construct and operate the proposed development.

The on-site access track layout has been designed to minimise environmental disturbance by avoiding sensitive habitats where possible; and keeping the length of track commensurate with the minimum required for operational safety. The track route also takes cognisance of the various identified environmental constraints.

13 watercourse crossings will be required as part of the track layout. These crossings would be designed to ensure that fish movements are not restricted (where applicable) in addition to ensuring the crossing size is adequate for potential flood flows.

Electrical Connection, Control Building & Substation

Assuming the use of the currently available models, each wind turbine would generate electricity at low voltage and would have an ancillary transformer located either within or outside the base of the tower to step up the voltage to the required on-site distribution voltage. Each turbine would be connected to any adjacent turbines by underground cables.

The wind farm substation is proposed to be located on the central part of the site as shown in **Figure 2: Infrastructure Layout**. All power and control cabling on the wind farm will be buried underground in trenches located, where possible, along the route of site access tracks.

The wind farm control building will be designed and constructed to the standard required by NIE for the accommodation of NIE substation equipment and wind farm equipment. Where possible, local building materials and finishes will be used to ensure that the appearance is in keeping with other buildings in the area.

Battery Energy Storage

Battery Energy Storage is a means of storing electrical energy just like a rechargeable battery, mobile phone or electric car. These are means by which power can be stored and released. The application is of course of a larger scale but the basic principle is the same.

Energy provision in Northern Ireland is undergoing a transition from one designed primarily around a number of large thermal power stations such as Kilroot, Ballylumford and Coolkeeragh to one which now includes a number of renewable generators such as wind farms. Renewable generation is now supplying over 40% of the total annual electrical requirement in Northern Ireland. The Renewable Energy target for Northern Ireland is 70% increasing to 80% by 2030 as per the Climate Change Act (Northern Ireland) 2022.

There are, however, technical constraints on the transmission network which are limiting the amount of renewable energy which can be delivered from these renewable generators to the main demand centres in the east of the province.

Battery Energy Storage is an innovative solution, which is being deployed across the world, to facilitate the shift from traditional thermal generation to low/zero carbon generation. The energy storage containers will help match generation produced from intermittent renewable generation with the peaks and troughs in electricity demand.

The Battery Energy Storage (BESS) will comprise 20 permanent containers housing energy storage devices, associated inverters and ancillary equipment. Permanent fencing will enclose the containers. The BESS will be positioned adjacent to the control building and substation compound on hardstanding used originally for the temporary construction compound.

Construction Management

An Outline Construction Environmental Management Plan (OCEMP) is included within the Environmental Statement and a final CEMP will be prepared and agreed with the relevant statutory consultees prior to construction commencing. This will describe the detailed methods of construction and working practices, work to reinstate the site following completion of construction activities and methods to reinstate the site post operation. The CEMP will:

- Provide a mechanism for ensuring that measures to prevent, reduce and where possible offset potentially adverse environmental impacts identified in the ES are implemented;
- Ensure that good construction practices are adopted and maintained throughout the construction of the Proposed Development;
- Provide a framework for mitigating unexpected impacts during construction;

- Provide a mechanism for ensuring compliance with environmental legislation and statutory consents;
- Provide a framework against which to monitor and audit environmental performance.

The runoff drainage system will be designed to mimic natural conditions to mitigate against increased flashiness in water courses and reduced groundwater recharge. The SuDS will protect the status of water courses and ground waters.

Construction will be carried out according to Department of Agriculture, Environment & Rural Affairs (DAERA) and Construction Industry Research and Information Association (CIRIA) guidance for site works. Pollution control measures during the construction phase will be included in the Construction & Decommissioning Method Statement (CDMS), which will be agreed with the Planning Authority before starting construction work on site.

It is anticipated that the construction would take approximately 18 months. Construction work will take place between the hours of 0700-1900 Monday to Friday and 0700 – 1300 on Saturdays. Outside these hours, work at the site shall be limited to turbine erection, testing/commissioning works and emergency works. Deliveries may occur outside these times to minimise disruption to local residents.

A programme of reinstatement would be implemented upon completion of construction. This would relate to the construction compound, temporary areas of the crane hardstandings, cable trenches and track shoulders where appropriate. There remains a potential to use cranes during the operational phase of the Proposed Development, therefore the main crane hardstanding will remain uncovered.

Operation

The expected operational life of the wind farm is 35 years from the date of commissioning.

Each turbine at the Proposed Development would be fitted with an automatic system designed to supervise and control a number of parameters to ensure proper performance (e.g. start-up, shut-down, rotor direction, blade angles etc.) and to monitor condition (e.g. generator temperature). The control system would automatically shut the turbine down should the need arise. Sometimes the turbines would re-start automatically (if the shut-down had been for high winds, or if the grid voltage had fluctuated out of range), but other shut-downs (e.g. generator over temperature) would require investigation and manual restart.

The Proposed Development itself would have a sophisticated overall Supervisory Control and Data Acquisition system (SCADA) that would continually interrogate each of the turbines and the high voltage (HV) connection. If a fault were to develop which required an operator to intervene then the SCADA system would make contact with duty staff via a mobile messaging system. The supervisory control system can be interrogated remotely. The SCADA system would have a feature to allow a remote operator to shut down one or all of the wind turbines. This is monitored 24 hours a day, 7 days a week.

An operator would be employed to operate and maintain the turbines, largely through remote routine interrogation of the SCADA system. The operator would also look after the day-to-day logistical supervision of the Development and would be on-site intermittently.

Routine maintenance of the turbines would be undertaken approximately twice yearly to ensure the turbines are maintained to Industry Standard. This would not involve any large vehicles or machinery.

Habitat Management

A Habitat Management Plan will be implemented during the construction and operational phases of the Proposed Development, working with the site landowners, which will provide for the restoration and enhancement of blanket bog and heathland habitats on site.

Decommissioning

One of the main advantages of wind power generation over other forms of energy production is the ease of decommissioning and the simple removal of components from the site. The residual impact on the site is limited to the continued presence of the foundations and access tracks. All above ground structures can be removed from the site.

If the Proposed Development obtains planning approval it is expected that a planning condition would be set to provide for the decommissioning and restoration of the site in accordance with a scheme agreed in writing with Department for Infrastructure (DfI), which would consider the long term restoration of the site at the end of the lifetime of the Proposed Development.

The Proposed Development will be decommissioned in accordance with best practice at that time and/or in compliance with any planning conditions. Current best practice includes the removal of all above ground structures (e.g. turbines, substation etc); the removal of certain underground structures where required (e.g. cables); and reinstatement of disturbed areas all of which will be subject to any necessary consents. Consideration will be given to the retention of wind farm access tracks if they utilise pre-existing farm infrastructure or are not located on sensitive habitats if such continued use could lead to the long-term degradation of these habitats.

The EIA Process

The purpose of EIA is to provide adequate environmental information to enable stakeholders to understand the potential environmental effects of a project. The EIA identifies and assesses the potential environmental effects associated with the construction, operational and decommissioning of the Development. The assessment and potential effects are recorded in the ES.

Consultation

Public Consultation

RES is committed to finding effective and appropriate ways of consulting with all its stakeholders, including local residents and community organisations, and believes that the views of local people are an integral part of the development process. RES began the engagement process with the local community in August 2023 to facilitate a constructive consultation process which helped RES to understand and address any concerns as the project developed.

Two public exhibition events were held in September 2023, whereby information was presented on exhibition boards including information which included detailed maps and information about the proposals, including: a map of the proposed layout; photomontages representing how the proposed layout would appear from a range of viewpoints, and; Zone of Theoretical Visibility (ZTV) drawings. (A ZTV is a map-based diagram of where and how many wind turbines, or wind farms, would theoretically be visible from all parts of a given area.)

An online public exhibition was held in September 2023 which displayed all of the aforementioned information that was available at the public exhibition. RES staff were available for telephone/video conference meetings to answer questions and feedback was encouraged.

A Pre-Application Community Consultation (PACC) Report has been produced and is available for viewing at the locations listed in the Preface.

EIA Consultation

RES and the various chapter authors have undertaken pre-application consultation with relevant consultees, which has informed the EIA process and is detailed in each of the technical chapters within the Volume 2 (Main Report) of the ES.

Wind Farm Design Evolution & Alternatives

In accordance with EIA process and best practice the project team employed an iterative approach to the design of the Proposed Development. The design evolved throughout the EIA process as different constraints and adverse/ beneficial effects were identified and evaluated. This approach allowed mitigation measures to be integrated into the design in order to alleviate or remove significant effects of the Proposed Development. It also allowed measures to enhance beneficial effects of the Proposed Development to be incorporated into the design.

Following consultation and baseline characterisation of the Site, the following key topics were identified:

- Landscape and visual;
- Archaeology and cultural heritage;
- Vegetation and Peatland;
- Terrestrial Fauna;

- Ornithology;
- Fisheries;
- Geology and water environment;
- Noise;
- Traffic and Transport;
- Shadow flicker; and
- Socioeconomics.

The topics listed above were considered through the design with the aim of designing out significant effects. Where it was not possible to mitigate by design, the issues were considered further as part of the EIA.

A key tool in this process was the combined constraints drawing, which identifies constraints to development and sensitive features on the site. This drawing was iteratively updated as new information from surveys, site visits and consultation was received.

Initial Turbine Layout (Feasibility Stage)

At the beginning of the development process an initial layout was produced to show the maximum potential extent of the development within the space available and in accordance with the design principles and preliminary environmental information, prior to baseline surveys being completed. The layouts were informed by the following constraints:

- Preliminary ecological constraints;
- Preliminary watercourse buffers;
- Slope;
- Separation distance from housing; and
- Tip height + 10% to public roads, in accordance with the Best Practice Guidance to PPS 18[2].

This identified that the Site could potentially accommodate 14 turbines, to be further refined throughout the EIA process.

Primary Turbine Layout (EIA Baseline Stage)

Combined Constraints

Detailed environmental and technical surveys were completed to characterise the baseline environmental conditions on the Site and associated study areas, as described in more detail in Chapters 4 to 13 of this ES. Any constraints to development, or avoidance areas, resulting from the baseline surveys were used to build up the combined constraints drawing.

Water Environment and Fisheries

Following the baseline survey the hydrology consultant recommended watercourse buffers of 50 m and 10 m depending on the sensitivity of the watercourse, which were agreed as appropriate by the fisheries consultant.

Terrestrial Fauna

A 25 m buffer was applied to a badger setts identified through the baseline surveys.

Bat buffers of 50 m were added to major watercourses, as advised by the ecological consultant. This achieves a 50 m buffer between the blade tip and the watercourse feature, in line with Bat Conservation Trust guidance. This is based on an assumed blade length of up to 74m, hub height of up to 105m and maximum feature height of 5 m.

S. pratensis was thinly recorded within areas of rush pasture throughout the extent of the site, and no devils- bit scabious was recorded. Therefore, the site is deemed to have negligible breeding potential for marsh fritillary butterfly.

Vegetation and Peat Stability Assessments

Areas of potentially active peat and species rich grassland were mapped as initial avoidance areas, as recommended by the vegetation and peatland consultant.

Following baseline peat probing and peat slide risk assessment, areas of deeper peat were avoided to limit excavation and spoil generation. Areas identified as medium and high peat instability were identified and avoided.

Public Roads and Overhead Electricity Lines

Buffers were applied to nearby public roads in line with the Best Practice Guidance to PPS18 which recommends a setback distance of at least tip height plus 10% between turbines and roads.

Landscape & Visual

Zone of Theoretical Visibility (ZTV) visualisations were prepared in order to indicate where all, or part of, the Proposed Wind Farm Development is likely to be visible from. The ZTV is first used to assist the identification of areas with theoretical visibility and the location of viewpoints as part of the baseline landscape and visual assessment. It is then used to aid the assessment of visual effects because the turbines would be the most visible element of the Proposed Wind Farm Development, particularly during the operational period. As described in earlier sections they are also useful in considering the height and geometry of the turbine model selected.

At an early stage of the EIA process a provisional list of viewpoints was created, from which provisional wirelines were generated, which were used to identify any potential landscape and visual issues with the turbine layout, as well as from the effects of the wind farm as a whole.

The presence of outlying turbines was addressed in the iterative design process and efforts were made to minimise instances where turbines were located at some distance or at

noticeably different heights from the grouping of turbines in order to create a compact layout that minimised the geographical extent and variable height within the Proposed Development whilst also maintaining an evenly spaced layout where turbine heights instances of stacking where also minimised.

Multidisciplinary Site Walkover

A multidisciplinary site walk-over was arranged by RES, involving development, ecology, engineering, and construction to collaboratively review and refine the layout, discuss interrelationships and mitigation, resolve potential conflicts and agree actions for further assessment.

Final Turbine Layout

The final turbine layout is shown in **Figure 2** and consists of 11 turbines of up to 180m tip height. The final layout, including turbines and infrastructure along with the combined constraints is shown in **Figure 3**.

A 50 m micrositing radius was applied to each of the turbines. The extent of this micrositing area was then reduced such that the micrositing avoids any of the combined constraints. The final micrositing areas are included in **Figure 2: Infrastructure Layout.**

Using design principles agreed with environmental, engineering and technical disciplines, the infrastructure layout was developed and used to undertake baseline assessments.

Key adjustments in response to constraints made through the design evolution are summarised in the following sections.

Infrastructure Design Evolution

The infrastructure design has evolved through the EIA process. The following general principles were taken into consideration when designing the supporting infrastructure:

- Maximise use of existing infrastructure to reduce land take;
- Avoidance of environmental and technical constraints (as shown in Figure 3);
- Design of the track layout to follow natural contours as far as possible, in order to avoid unnecessary amounts of excavation and reduce adverse hydrological impacts;
- Minimisation of the overall length of access track;
- Minimisation of the number of watercourse crossings, as far as possible;
- Avoidance of steep slope areas to minimise earthworks; and
- Incorporation of measures to improve the visual appearance of the scheme, including reinstatement of some elements of temporary infrastructure following the construction period, reinstatement of road widening areas, and consultation with the landscape consultant on the position of the control room and substation building and energy storage area.

Key adjustments in response to constraints made through the design evolution are summarised in the following sections.

Vegetation and Peatland

- Following the advice of the vegetation and peatland specialist a number of refinements were made to the track layout in order to minimise impacts to blanket bog habitats, including the following:Re-alignment of track to T2 to avoid peat habitat
- Re- alignment of track to T4 & T5 to avoid peat habitat
- Track moved further south-east from T3 to T8 to avoid peat habitat
- Track redesign, between T6, T7 to reduce the amount of earthworks required and excavation of peat habitat

Water Environment

The location and nature of watercourse crossings were reviewed with the hydrology and fisheries consultants. Following the mitigation detailed in **Chapter 9: Fisheries and Chapter 10: Geology & Water Environment**, a number of refinements were made to avoid and reduce potential effects as far as possible, including the following:

- Realignment of site entrance to avoid hydrological features
- Removal of track (subsequent to the removal of T10) to access T10 (See Figure 3.3, Design 2) due to proximity to hydrological feature
- Location of substation, temporary construction compound and BESS relocated to avoid hydrological features and peat habitat

Site Entrance Location

The site entrance is located to the South of the Carrickayne road. There has been 2 different iterations of the site entrance location, however this has always been accessed via the Carrickayne road. Local movement to the site entrance such as can be seen in Design 1, to Design 2 in Figure 3.3 Infrastructure Design Evolution; this was due to the proximity of the site entrance to hydrological features. The site entrance was moved West to avoid the need to construct watercourse crossings and unnecessary associated construction or excavation works.

Control Building and Substation and Battery Energy Storage

The control building has relocated throughout the design of the proposed wind farm. However through the course of the design evolution the location of the control building, substation and battery energy storage compound was moved to a flatter area of ground, that was not subject to any areas of deep peat, and had minimal proximity watercourses within the total development area, in order to reduce excavation and spoil generation, whilst remaining outside environmental constraints.

Temporary Construction Compound / Battery Energy Storage

In all 4 of the iterations of the infrastructure design evolution, the Temporary construction compound has relocated slightly. However, through the course of the design evolution the location of the temporary construction compound was moved further South to a flatter area of ground, that was not subject to any areas of deep peat, and had minimal proximity watercourses within the total development area, in order to reduce excavation and spoil generation, whilst remaining outside environmental constraints.

Environmental Effects

The following sections summarise the technical chapters of the ES.

Policy

The Planning Policy Chapter of the ES sets the planning and energy policy context for the Proposed Development that will guide a decision on the planning application. This commentary considers the need for the Proposed Development set within wider global efforts to combat climate change, considering relevant and recent publications from bodies such as the United Nations (UN), as well as considering the legislative context which targets a reduction in greenhouse gas emissions and an increase in renewable energy generation, at a United Kingdom (UK) and Northern Ireland level.

The Planning Policy Chapter also discusses the Proposed Development in the context of national and local planning policy in Northern Ireland, including commentary on key planning policy documents including, but not limited to:-

- The Regional Development Strategy 2035 (RDS) (March 2012) which provides an overarching strategic planning framework to facilitate and guide development for the Region up to 2035;
- Planning Policy Statements (PPS) covering various topics including the Strategic Planning Policy Statement (SPPS) for Northern Ireland (September 2015) and PPS18 'Renewable Energy';
- Derry Area Plan (2011); and
- Strabane Area Plan 1986-2001.

In discussing the above planning and energy policy documents in the Planning Policy Chapter regard was had to the findings of the other technical and environmental chapters of the ES. In considering the degree to which the Proposed Development complies with individual planning policies or stated policy objectives, particular attention was paid to the residual effects of the Proposed Development upon environmental topic areas and receptors as taken forward for detailed assessment in each ES chapter.

The identification of significant effect(s) within an ES does not mean that a proposal is unacceptable in planning policy terms. The findings of the ES are used as a tool to enable the decision maker to come to a conclusion about the acceptability of a proposal, having considered it 'in the round' against the full suite of planning and energy policies, relevant legislation and targets and land use allocations/designations relevant to a site.

The conclusions of the Planning Policy Chapter consider the extent to which identified environmental impacts of the Proposed Development, as set out in the ES, are considered to be acceptable and thus the extent to which the Proposed Development is considered to comply with planning policy overall.

Each of the proposed wind turbines will have a generating capacity of 6 MW each, meaning that overall the Proposed Development will have a 66 MW generating capacity, excluding the energy storage facility. Using these figures, it is estimate that the Proposed Development could generate approximately 280 GigaWatt Hours (GWh) of renewable electricity per year. This would, in turn, reduce carbon dioxide (CO_2) emissions by 118,000 tonnes each year, amounting to 4,130,000 tonnes over the proposed 35-year operational life.

The Proposed Development will therefore make a positive and meaningful contribution to the achievement of Northern Ireland's goals of achieving a 100% reduction in greenhouse gas emissions by 2050 compared to 1990 levels, as well as contributing to the target that at least 80% of electricity consumption is from renewable sources by 2030. These targets are set in law, through the Climate Change Act (Northern Ireland) 2022.

Landscape and Visual

An LVIA is a formal part of the EIA process and the methodology used to prepare the LVIA is defined by the requirements of the Planning (Environmental Impact Assessment) Regulations (Northern Ireland) 2017 (hereinafter referred to as the 'EIA Regulations') and best practice guidance publications relating both to the LVIA process in general and in specific relation to wind farm developments (refer to ES Volume 4 Technical Appendix 4.1 for further details).

The purpose of the Landscape and Visual Impact Assessment (LVIA) is to present a thorough and objective analysis of the landscape and visual character within a Study Area extending in a 30 km radius from the Proposed Development. This includes an analysis of landscape and visual receptors present within the Study Area including those occurring at close, medium and long range in accordance with best practice guidance on LVIA, wind energy development in Northern Ireland, and emerging Council policies and objectives in relation to the Study Area. The Baseline Assessment also considered non-statutory landscape classifications, and the information gleaned through driving and walking surveys of the Study Area to amplify and enhance the understanding of its landscape and visual character. The potential effects of the Proposed Development on these baseline conditions including direct, indirect, permanent, temporary and cumulative effects are then identified and analysed. All information is presented clearly and objectively in a manner that will inform the decision-making process with a well-reasoned methodology that is in accordance with best practice guidance. Landscape and visual effects are distinct although closely related to each other and addressed as such. The former relates to the effects on the physical landscape as a resource in its own right. The latter relates to the effects on specific views and general visual amenity as experienced by people (hereinafter referred to as visual receptors). Appropriate mitigation measures are proposed to address likely significant effects, where possible, and to assess any residual effects that would remain following the implementation of these measures.

In terms of both landscape and visual effects the Proposed Development conforms to the general principles laid out in the policy and best practice guidance which are broadly promotive of renewable energy developments as a means of mitigating against the effects of climate change. The Best Practice Guidance to Planning Policy Statement 18 (BPG) states that, given their importance, is it important for society at large to accept wind farms as a feature of the Region for the foreseeable future and that, whilst some locations may be highly visible, this does not necessarily render them unacceptable. The BPG also notes that groups of turbines can normally appear acceptable as single isolated features in open, undeveloped landscapes and this principle can be applied to the Proposed Development's position within its landscape and visual context. The Proposed Development also conforms to the majority of the landscape and visual character issues that the Supplementary Planning Guidance to PPS 18 (SPG) notes should be considered for wind energy developments within the North West region. Furthermore, its visibility from key parts of the Study Area, including the majority of the AONB and its core area is particularly limited.

Whilst the Proposed Development would have a direct and significant physical effect on the part of the Study Area and Landscape Character Area 29 (LCA), within which it is located, the magnitude of change would be medium because the Proposed Development is located on an outward-facing slope, is not visible from the majority of the core part of the AONB, including the Glenelly Valley and South Sperrin range of uplands. The site of the Proposed Development has no formal recreational amenity functions, which the SPG notes would increase landscape and visual sensitivity. It is also positioned within a Study Area where existing and consented wind farms and single turbines are already a defining feature of landscape character.

The Proposed Development may have indirect effects on the landscape character of some other parts of the Study Area which are in proximity to it, or which contain viewpoints used in this LVIA. However, there are unlikely to be any discernible effects on their physical landscape character resulting from the Proposed Development due to the physical distance between them. In relation to these other LCAs sensitivity is generally high due to their location within the AONB. However, the magnitude of effects resulting from the Proposed Development would be low to negligible and in no instances are the physical effects on landscape character deemed to be significant.

It would have a significant visual effect on only three of the 19 Viewpoints which were chosen to represent typical views within the Study Area. All are located within approximately 5 km and from locations where the Proposed Development would be both prominent and visible in its entirety or near-entirety from rural roads and areas of settlement. These viewpoints are also all located to the north and north-west on uplands adjacent to the site of the Proposed Development. Conversely, from viewpoints located at similar distances to the south of the Proposed Development are found to experience no significant effects despite being located within and around the scenic Glenelly Valley, which

forms a key part of the AONB core. From these locations there would be acute angles of view and higher levels of vegetation cover from the valley areas which would screen views. Views from more elevated locations tend to be screened by the summit of Mullaghclogher and the proposed turbines are located on the north and west-facing side slopes and are therefore also substantially screened from view. From other parts of the AONB, the Proposed Development may become more visible in its entirety but views are lessened in magnitude and significance because views available from these locations are not solely focused on the site of the Proposed Development. Rather, these views frequently encompass much wider panoramas where the site and the Proposed Development comprise a small part.

In recognition of its location within the Sperrin AONB and the Sperrin Mountains LCA the layout and position of the Development has been designed to minimise its effect on the AONB as a whole and this has been achieved by locating it away from the core area containing the majority of visitor attractions and key landscape features. It is noted that the BPG recognises that wind farms may be expected to be relatively prominent within distances of approximately 5 km but that clear visibility does not automatically equate to the development being unacceptable. It is also noted that the majority of the AONB, even at close range would experience limited visibility of the Proposed Development and no significant effects. Furthermore, from the majority of the Study Area, including the AONB, the Proposed Development would have no little to any visibility and would result in no significant visual effects. Therefore, the Proposed Development would not affect the overall integrity of the AONB.

Although the effect on the physical character of the site and immediate surrounding landscape would be significant because there are currently no other such features in close proximity, the Proposed Development would be physically separate from both the Owenreagh and Sperrin Foothills clusters of wind farms which defines the western-most end of LCA 29 and the Sperrin Foothills LCA to the north west. It would therefore have limited magnitude of cumulative effect on landscape character when considered in combination with these wind farms. Although it would incrementally increase the physical presence of wind turbines in this part of LCA 29 it is not of such a scale that it would cause the landscape character to become more defined by wind farms than by other landscape attributes. There are no other wind farms in proximity to the Proposed Development and its incremental cumulative effect on the landscape character of the Study Area as a whole is therefore deemed to be of low magnitude and not significant. It is also noted that wind farms are not an uncommon feature in approaches to the AONB and there is already a repeating pattern of wind farms and single turbines across other parts of the Study Area and around the edges of the AONB.

The Proposed Development would have no significant incremental cumulative visual effect on any of the 19 Viewpoints considered in this LVIA because it is largely perceived as a

standalone development with no visual relationship of any great magnitude with other wind farms in the cumulative baseline.

The Proposed Development would have no significant effects on landscape character and limited visibility across the wider Study Area as a whole. This is expressed by only four of the 19 representative viewpoints experiencing significant visual effects, and none experiencing significant cumulative visual effects. Therefore, the LVIA concludes that the Proposed Development is acceptable in landscape and visual terms.

Archaeology and Cultural Heritage

The Cultural Heritage and Archaeology assessment considers the likely significant effects on the historic environment (Archaeology and Cultural Heritage) associated with the construction, operation and decommissioning of the proposed Mullaghclogher Wind Farm (the Proposed Development).The assessment provided in the Archaeology and Cultural Heritage segment was informed by a comprehensive assessment of the potential direct and indirect impacts the Proposed Development could have on the significance of designated heritage assets in the wider area due to changes to their settings, which is provided by the CHBA provided in Appendix 5.1.

The assessment of designated heritage assets provided in the CHBA highlighted a number of assets that required more detailed assessment due either to their proximity to the proposed development, their sensitivity, or the complexity of the issues surrounding their assessment which meant that they would benefit from fuller assessment within the ES.

A total of fifteen such assets were identified, as follows:

- SM1 - TYR 011:018 – Giants Grave Scheduled Monument
- SM2 -TYR 006:006 – Court Tomb: The White Rocks Scheduled Monument
- SM3 - TYR 006:030 – Two Stone Circles and Stone Alignment Scheduled Monument
- SM4 - TYR 006:004 – Cashel Scheduled Monument
- SM5 - TYR 006:047 – Field Walls and Cairns Scheduled Monument
- SM6 - TYR 006:044– Stone Circle, Cairns and Alignments Scheduled Monument
- SM7 - TYR 006:045 – Stone Circle, Cairns and Alignments Scheduled Monument
- SM8 - TYR 006:046 – Field Walls, Cairns and Standing Stones Scheduled Monument
- SM9 - TYR 026:005 – Stone Circle and Alignment Scheduled Monument
- SM10 - TYR 011:016 – Castledamph Circle: Two Stone Circles, Cairns with Cists and Two Alignments Scheduled Monument
- SM11 - TYR 011:015 – Bronze Age Ceremonial Landscape Scheduled Monument
- SM12 - TYR 006:022 – Two Stone Circles and Possible Alignment Scheduled Monument

- SM13 - TYR 011:004 – Castledamph Rath Scheduled Monument
- LB1 - HB10/09/006 – St Marys Roman Catholic Church, Grade B1
- LB2 - HB10/05/019 – 141 Glenelly Road, Grade B2

The assessment of archaeological heritage assets provided in the CHBA highlighted several assets that required more detailed assessment due either to their proximity to the proposed development, their sensitivity, or the complexity of the issues surrounding their assessment which meant that they would benefit from fuller assessment. A total of five such assets were identified, as follows:

- TYR 011:014 – Megalithic Tomb, Undesignated monument
- TYR 011:032 – Cairn, Undesignated monument
- TYR 011:033 – Cairn, Undesignated monument
- TYR 011:006 – Beacon, Undesignated monument
- TYR 006:052 – Booley House, Undesignated monument

Potential for Direct Physical Impacts

The potential for buried archaeological remains to be present within the Site was assessed by review of the available evidence undertaken within the CHBA, which confirmed that the Site has a known potential to contain one beacon (TYR 011:006). Therefore, there is a low potential for prehistoric remains associated with ceremonial and symbolic activity due to likely disturbance caused by the adaptation of TYR 011:006 into a beacon and a moderate potential for the presence of yet unknown prehistoric remains. There is also a low potential for remains associated with the Early Christian / Medieval period. Finally, there is a known potential for the Post-Medieval / Modern period and a low potential for the presence of yet unknown Post-Medieval / Modern period associated with agricultural processes.

The Proposed Development has been designed to avoid all recorded archaeological heritage assets whose location is confirmed, and so no known buried archaeological remains would be impacted by the Proposed Development. There is potential for localised impacts to result to as yet unknown buried archaeological remains (A6), which could result in a **minor effect**. In response a programme of archaeological works is proposed, which would record any remains prior to construction, and would realise the research value of the remains. With the benefit of such a programme works, the significance of any effects to buried archaeological remains would be at most **slight adverse.**

Potential Indirect Effects due to Changes to the Setting of Heritage Assets

The CHBA recommended that all of the above mentioned cultural heritage assets should be considered in detail in the EIA, and as a consequence these were considered in detail by this chapter. This process has found that in most cases, the degree of effect which would result from the proposed development would be no more than slight adverse, and in no instance

would the proposed development result in a significance of effect higher than **minor adverse**.

The potential for indirect effects to the remaining heritage assets in the wider study area, which could result from the Proposed Development, was considered in detail in the CHBA. It was concluded that the Proposed Development would have no more than a slight adverse effect on the remaining heritage assets in the wider area, which would not comprise significant environmental effects. As such, it is not necessary to consider these effects in detail within this chapter. However, the CHBA is provided in Appendix 5.1, where detailed assessments of all the remaining heritage assets can be found if needed.

In all cases, the effects are medium term and reversible, and in no instance would the proposed development directly affect a key aspect of the significance of any of these assets.

Cumulative Effects

The potential for cumulative effects has been considered for each of the heritage assets assessed by this chapter. The assessment of potential cumulative effects has been made with reference to the cumulative baseline provided in Chapter 4 of the ES, together with information provided in the heritage viewpoints and LVIA.

The potential for cumulative effects was considered in detail, and it was found that the developments within the cumulative baseline are sufficiently far and well screened, that they would not affect the impact assessments within this chapter. As a result, it is concluded that during the construction and operation, the Proposed development and the presence of the developments within the cumulative baseline would not result in a materially higher level of effect to the identified heritage assets than what would result from the Proposed Development on its own.

In conclusion, the potential effects of the proposed development on the setting of heritage assets have been minimised by the design of the proposed development, and any archaeological impacts could be mitigated by a programme of archaeological works secured via planning condition. It would therefore be possible to implement the proposed development in accordance with the requirements set out in policies BH2 - 4 of PPS 6, paragraph 6.224 of the SPPS and policy HE1 in the LDP 2035.

Vegetation and Peatland & Terrestrial Fauna

The study methodology for the Ecological Impact Assessment included both desktop and field survey methods in order to assess the potential impact on local ecological and nature conservation interest. The purpose of an ecological survey is to identify 'valued ecological receptors', those species and habitats that are valued in some way for their ecological function, their contribution to biodiversity or are protected by specific legislation. The following specialist surveys were undertaken during both the 2023 field seasons; both on the site within the appropriate buffer zones:

- JNCC Phase 1 habitat survey

- NVC Phase 2 habitat survey
- Bat (Chiroptera spp) survey
- Otter (Lutra lutra) survey
- Badger (Meles meles) survey
- Common Lizard (Zootoca vivipara) survey
- Marsh Fritillary (Euphydryas aurinia) habitat survey

Features of conservation interest and importance were recorded and their locations were one of the key criteria that affected the wind farm layout. The location of the wind farm infrastructure avoids habitats and species of conservation interest where possible, and where this was not possible, mitigation and/or enhancement measures have been incorporated into the design to balance any detrimental impact.

The principal habitats on the site are extensive areas of semi-improved grassland, acid grassland, marshy grassland, blanket bog, wet and dry heath. Overall, the grassland habitats on site are of lower conservation value, while the blanket bog/wet and dry heath and are of moderate/high value.

Ecological constraints determined from extensive site surveys have been used to evolve the layout and design of the Development. The impact assessment is therefore based on a wind farm design that already includes a number of important mitigation measures.

A series of generic and specific mitigation measures including a Habitat Management Plan and mitigation for badgers and common lizard have been proposed to mitigate effects on NI Priority Habitats and Species.

The Development will result in permanent and temporary habitat loss of 11.4ha, largely comprising degraded blanket bog, wet (dwarf shrub) heath, acid grassland, and rush pasture (with both the species-rich and species-poor variant present on site) although small areas of other habitats will also be lost, such as marshy grassland, poor acid grassland and semi-natural woodland.

The loss of approximately 9.84[1] ha of NI Priority Habitats (i.e., degraded blanket bog, wet heath/heathy acid grassland and PMGRP) is a permanent and direct effect of medium to high magnitude on receptors of high value and sensitivity. The extent of habitat loss has been used to inform the prescriptions detailed in the Habitat Management Plan, including a commitment to establish 5-times the area lost for NI Priority Habitats (blanker bog, wet/dry dwarf shrub heath PMGRP). A HMA has been proposed (with a total area of 300ha) to compensate for the loss of habitats during the 30-year lifetime of the Development (including the remediation of blocks of grassland back to blanket bog/heath).

After implementation of the mitigation measures proposed in this chapter it is assessed that there would be no significant residual adverse effects on Northern Ireland priority habitats

[1] Includes an additional 1.55 ha of loss for temporary spoil storage

(wet heathland/blanket bog) as a result of the Development. Indeed, it is assessed that the Habitat Management Plan would deliver a net beneficial effect during operation by enhancing currently degraded blanket bog/wet heath and marshy grassland habitats.

There is no recorded usage of the area by otter or marsh fritillary butterfly, therefore no impacts to these species are likely. Mitigation for the herpetofauna found on site (common lizard) and badgers is proposed. For lizards this involves both the installation of drift fencing the mowing/hand clearance during the construction phase. While for badgers it involves the closure of a sett (under licence) during construction.

330-nights of static monitoring for bats was completed at (or in the vicinity of) each of the 11 turbines on the site. Overall, there were 308-nights with negligible bat activity, 86 of low activity. While moderate levels were experienced during 28-nights; 32-nights were high. Therefore, a BMMP (Bat Monitoring Mitigation Plan) has been recommended as a precaution. In conclusion, and based on current knowledge, this should ensure that the proposed Development will not have a significant impact on the local bat population.

The potential effects of the Development on ecological receptors have been assessed and it is concluded that with the implementation of appropriate mitigation measures the effects would be reduced to a minor adverse or neutral effect that would not adversely affect the ecological integrity of the site and the wider area.
An assessment of cumulative impacts on the habitats and fauna of the area was also undertaken, and it was concluded that there will be no significant effects.

Ornithology

The ornithology chapter assesses potential effects of the Proposed Development on bird communities. The assessment and associated survey work has been completed by David Steele who has 34 years of experience working as a professional ornithologist throughout Great Britain and Ireland and has completed ornithology assessments for 20 previous wind farm proposals in Northern Ireland.

The ornithology assessment has been carried out with reference to the relevant wildlife legislation and planning policy, notably The Wildlife (Northern Ireland) Order 1985, Annex 1 of the EC Birds Directive and Planning Policy Statement (PPS) 2 (Natural Heritage) for Northern Ireland.

The assessment focuses on assessing potential displacement effects and collision mortality effects of the Proposed Development on the bird communities found within the Preliminary Site Boundary and in defined surrounding buffer areas. Where relevant, the assessment also considers potential cumulative effects resulting from other wind farms in the vicinity of the Proposed Development.

Methodology

Surveys for breeding and non-breeding birds have been completed using the 'Brown and Shepherd' methodology during three consecutive summer and winter periods commencing in

spring 2020 and finishing in February 2023. An assessment of bird flight activity has also been completed during the same three year period. For the activity assessments two vantage points were used initially, increasing to three vantage points in Year 2 and five vantage points in Year 3. Checks for breeding activity by raptor species in the wider area around the Site have been carried out concurrently with the vantage point surveys.

Assessment

The Site and surrounding buffer area of the Proposed Development is overall of relatively low sensitivity for bird communities and there are no protected sites in the vicinity designated for ornithological features. Red grouse are present on the Site but with appropriate management of the construction phase then it is not expected that there would be any permanent adverse effects on this species.

There is a potential significant adverse effect for breeding snipe (displacement of one or two pairs) however the effect would be local and is not significant at a regional or national scale. Importantly, the published research indicates that adverse effects on breeding birds (including snipe) are likely to be due to disturbance during the wind farm construction phase and any subsequent effects during the operational phase are unlikely to be significant for local bird communities.

There are no Annex-1 raptor-species currently breeding in the near-vicinity of the Proposed Development (or likely to do so in at least the medium-term) and there are therefore no likely significant adverse effects for these species. For non-Annex-1 raptor species that are regularly occurring in the vicinity (buzzard and kestrel) there are unlikely to be any significant adverse displacement or collision mortality effects.

Potential cumulative effects have been considered in terms of other wind farms located within 10 km of the Proposed Development however no likely significant cumulative effects have been identified.

Mitigation

Details are provided of mitigation measures including the management of construction activity to avoid or minimize disturbance to breeding birds and also appropriate habitat management measures for breeding snipe. It is proposed that no development activity will take place on the Site between 1 March and 31 August in any year until an Ornithology Mitigation Strategy has been prepared by a suitably experienced ornithologist and approved by the Planning Authority. The outline Habitat Management Plan includes details of two Habitat Management Areas totalling 154.5 ha of land that is to be under management options that are beneficial for breeding snipe including a significant area that is >400 m from the turbine locations and so potentially optimal for breeding snipe.

Conclusions

The published research indicates that the principal adverse effects of wind farms on breeding birds are likely to be due to disturbance displacement during construction and that wind farm operation is unlikely to have a significant effect on local bird communities. Therefore assuming

full implementation of the mitigation measures (and in particular the measures relating to construction) it is concluded that the Proposed Development is unlikely to have any significant adverse effects on bird populations at the local, regional or national scale.

Fisheries

The key receptors for this assessment are the Upper Burn Dennet River, the Eden River, and the Glenelly River, together with a series of small tributary streams which drain the area within the Site Boundary.

The study focussed on the streams draining the proposed site and also on connected reaches of the Upper Burn Dennet River and main Eden River. Field surveys were carried out to assess stream quality, fish habitats and fish stocks. The approach was based on the selection of six principal survey sites to establish a baseline for any future monitoring required during construction or operational phases, with additional surveys of connected river sections to record fish habitat quality.

The proposed site lies principally within the Upper Burn Dennet River catchment with a small proportion draining to the Glenelly River via the Eden River tributary. Both river systems are locally important for recreational angling for Atlantic salmon, brown trout and sea trout. With regard to fisheries administration and legislation, the proposed Development is located within the geographic area of responsibility of the Loughs Agency.

In general, many of the streams within the Site boundary are of low fisheries value in terms of usable salmonid habitat due mainly to their diminutive size, lack of significant flow and absence of fish. However, the streams draining the site to the Upper Burn Dennet River, such as Stroanbrack Tributary 1 and the main Upper Burn Dennet River itself, are of greater significance due to the presence good quality fish nursery habitat and fair to good abundance of brown trout. Most of the streams draining the site are of Moderate to High water quality with good physical habitat supporting sensitive invertebrate species

The potential effects on fisheries and aquatic ecology were assessed for the construction, operational and decommissioning phases of the Development, and a series of mitigation measures are proposed to address significant effects.

Potential effects are mainly associated with ground disturbance during the construction phase and the entrainment of sediments in surface water drainage. Mitigation measures to address these impacts are recommended and focus on a bespoke surface water management plan and site drainage design using the principles of Sustainable Drainage, which promote the principles of on-site retention of flows and use of buffers and other silt removal techniques.

It is concluded that, provided the mitigation measures are implemented as specified, construction and operation of the proposed Development will have a Neutral effect on the

fish stocks and aquatic biology of the Upper Burn Dennet River, Glenelly, the Eden River and associated drainage streams.

Geology and Water Environment

An assessment of the likely effects of the Proposed Development on geology and the water environment has been undertaken. The impact assessment involved a combination of desk study, site visits and consultation with various stakeholders including; Department of Agriculture, Environment & Rural Affairs; Derry City and Strabane District; Department for Infrastructure; and Department for Economy.

The assessment identifies the potential impacts on geology, hydrology and hydrogeology, including surface water, groundwater, abstractions, the potential for pollution of watercourses and flooding. It summarises the relevant legislation and guidance and provides appropriate baseline information enabling potential effects to be identified.

The assessment determined that the site is located on 'moderate quality agricultural land' and 'poor quality agricultural land', and the loss (or partial loss), of agricultural function is not significant and does not constrain the Proposed Development. The underlying geology is predominantly a mixture of clay, sand, gravel, and boulders varying widely in size and shape, with extensive peat cover over much of the site. Bedrock underlying the site is composed of basalt. Groundwater flow within the bedrock is expected to be mainly shallow and discharging locally to surface waters especially in upland areas.

The current hydrology of the site consists of a number of natural source watercourses and streams and artificially modified agricultural drainage ditches and peat drains. The majority of on-site surface water features drain in a northerly direction towards the Burn Dennet River (Ballynamallaght). The Burn Dennet ultimately discharges to the River Foyle c. 15 km north-west from the Site.

Aspects of the design, construction, operation, and decommissioning of the Proposed Development that may impact on the receiving geological and water environment have been identified and the pathways of potential effects assessed. It has been determined that without mitigation, the Proposed Development would likely cause adverse effects on the water environment due to its hydrological link to watercourses with significant fisheries interests within and downstream of the Site.

Mitigation measures integrated as part of outline design, and others to be implemented throughout the lifetime of the Proposed Development to minimise potential adverse effects include:

- Design of site elements to minimise impact on the geological and water environment (e.g., careful consideration of the positioning of wind turbines, foundations, and areas of hard standing);

- Avoidance of significant water features based on baseline constraints mapping (i.e., establishing zones around watercourses where construction works are to be avoided);
- Careful management of water features where they come into contact with new infrastructure or upgraded access tracks, and ensuring that the watercourses bed is unaffected by any culvert where a track crossing is required where there is fishery habitat, by using a bridge rather than culvert structure.
- Implementation of a comprehensive surface water management plan comprising the use of SuDS (drainage) and silt management to prevent pathways for pollution reaching the wider environment as well as reducing any increased risk of flash flooding downstream;
- Establishing pollution prevention procedures in accordance with NIEA requirements and guidance to minimise the risk to the wider environment posed by construction, operation and decommissioning-phase activities (e.g., spillage of oils or chemicals).

Implementation of the mitigation proposed would result in no significant residual effects to the receiving geology and water environment as a result of the Proposed Development. Monitoring the effect of the Proposed Development on the water environment and fisheries habitat will be provided through water quality monitoring.
An assessment of cumulative impacts was also undertaken, and it was concluded that there are no predicted significant water environment or geological effects arising from the Proposed Development in conjunction with any other pre-existing or consented development.

Noise

An assessment of the acoustic impact from both the construction and operation of the proposed Mullaghclogher Wind Farm was undertaken taking into account the identified nearest residential properties.

The operational noise impact was assessed according to the guidance described in the 'The Assessment and Rating of Noise from Wind Farms', referred to as 'ETSU-R-97', as recommended for use in relevant planning policy. The methodology described in this document was developed by a working group comprised of a cross section of interested persons including environmental health officers, wind farm operators and independent acoustic experts. It provides a robust basis for assessing the noise impact of a wind farm and has been applied at the vast majority of wind farms currently operating in the UK.

ETSU-R-97 makes clear that any noise restrictions placed on a wind farm must balance the environmental impact of the wind farm against the national and global benefits that would arise through the development of renewable energy sources. The assessment also adopts the latest recommendations of the Institute of Acoustics 'Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise'.

Representative baseline conditions (the "background noise level") at nearby residential properties were established by undertaking noise surveys. These measured levels were then used to infer the background noise levels at other nearby residential properties as the ETSU-R-

97 document recommends. As background noise levels depend upon wind speed, as indeed do wind turbine noise emissions, the measurement of background noise levels at the survey locations were made concurrent with measurements of the wind speed and wind direction. These wind measurements are made at the wind turbine site rather than at the survey locations, since it is this wind speed that would subsequently govern the wind farm's noise generation.

A sound propagation model was used to predict the noise levels due to the proposed wind farm at nearby residential properties over a range of wind speeds, taking into account the position of the proposed wind turbines, the nearest residential properties, and the candidate wind turbine type. The model employed (which considered downwind conditions at all times) took account of attenuation due to geometric spreading, atmospheric absorption, ground effects and barriers. It has been shown by measurement-based verification studies that this model tends to slightly overestimate noise levels at nearby residential properties.

The relevant noise limits were then determined through analysis of baseline conditions and the criteria specified by the ETSU-R-97 guidelines. The general principle regarding the setting of noise criteria is that limits should be based relative to existing background noise levels, except for very low background noise levels, in which case a fixed limit may be applied. This approach has the advantage that the limits can directly reflect the existing noise environment at the nearest residential properties and the impact that the wind farm may have on this environment. Different limits are applicable depending upon the time of day. The daytime limits are intended to preserve outdoor amenity, whilst the night-time limits are intended to prevent sleep disturbance.

The predicted operational noise levels are within noise limits at nearby residential properties at all considered wind speeds with the adoption of a noise management strategy. The Proposed Development therefore complies with the relevant guidance on wind farm noise and the impact on the amenity of all nearby properties would be regarded as acceptable.

A construction noise assessment, incorporating the impact due to increased traffic noise, indicates that predicted noise levels likely to be experienced at the nearest residential properties are below relevant construction noise criteria at all residential properties.

An acoustic assessment of the proposed energy storage facility in accordance with BS 4142: 2014 shows that the impact would be low and the levels insignificant in comparison to the wind farm noise levels.

Traffic & Transport

An assessment of the potential impact of the Proposed Development on traffic and transport was undertaken, involving consultation with Department of Infrastructure (DfI) Roads.

The proposed delivery route for large turbine components (abnormal loads) from the A6 before taking the turn off onto the Baranilt Road. Passing through Claudy, before turning left onto the Learmount Road, then a right onto the Longland road at Ballyrory. The route takes a left turn after the Ballynacross road. The road continues on, before passing onto the Aghafad road the site is proposing the development of a new access track from the Aghafad

road, onto the Lisnaragh road, and continuing South towards the site before making a lefthand turn onto a connecting road, commonly known as the 'Ramper' road which brings the deliveries to the Carrickayne road.

The proposed return route for the delivery vehicles is similar to the proposed delivery route noted above. Once the turbine components have been delivered, the vehicles will be shortened so they are no longer than a typical articulated HGV.

Widening works, either temporary road widening or vegetation removal, to facilitate oversail of the components will be required at various locations along the AIL delivery route. The widening works, where required, will include the installation of hardstand areas and vegetation trimming to facilitate the passage of AILs, which then will be reinstated once turbine delivery has been undertaken. If road widenings require the removal of boundary features such as fences, trees or hedgerows, these will be reinstated at suitable locations. Reinstatement will also be applied to any street furniture which may be removed on a temporary basis. In the unlikely event that a replacement blade is required during the operational phase of the wind farm, the widenings will need to be reopened temporarily, after which they will be reinstated. Any works will be undertaken following consultation with DfI Roads.

Normal HGV deliveries of concrete and stone respectively will also utilise the B48 but could do so from either direction dependant on the source of material and subject to confirmation with DfI Roads. Proposed HGV delivery routes are shown on **Figure 4: HGV Routes**. No passing bays will be required as the roads are two-way with adequate passing provided.

Where agreed by Dfl Roads, circular HGV haul routes may be implemented for the construction phase of the project.

The main traffic impacts are associated with the increase in HGV vehicle movements along the outlined route and surrounding tertiary road network during the construction stage of the project. These roads have low levels of existing traffic and a small number of receptors will be affected. At worst, the frequency of vehicle movements is expected to be one vehicle every five minutes during the six days when the construction of each wind turbine foundation would occur.

Consideration has been given to the effect of increased HGV traffic flow on Severance, Driver Delay, Pedestrian Delay, Pedestrian Amenity, Fear and Intimidation, Accidents and Safety and Cumulative Impacts. Furthermore, consideration has been given to the environmental effects of any road improvement/widening works.

A Traffic Management Plan (TMP) will be developed and agreed with the local community and other relevant stakeholders, pre-construction, in order to control and mitigate impacts associated with increased vehicles movements.

Taking into account the existing vehicle movements on the affected roads, and the proposed type and frequency of vehicle numbers, it is considered that with the appropriate mitigation measures as set out above, there will be no significant impacts.

Shadow Flicker

A shadow flicker analysis of the Proposed Development was performed. Under certain combinations of geographical position, time of day, time of year and meteorological conditions, the sun may pass behind the turbine rotor and cast a shadow over neighbouring buildings' openings (i.e. windows and doors) where the contrast between light and shade is most noticeable. To a person within that room the shadow, depending on its intensity, may appear to flick on and off, giving rise to an effect referred to as shadow flicker.

The Best Practice Guidance to Planning Policy Statement 18 (PPS18) states that at distances greater than 10 rotor diameters from a turbine, the potential for shadow flicker is very low.

An analysis of shadow flicker throughout the year from Mullaghclogher Wind Farm was carried out, taking into account the behaviour of the sun, the local topography and the turbine layout and dimensions. The analysis was performed using a turbine layout consisting of 11 turbines, each with maximum tip heights of up to 180 m and maximum rotor diameter of up to 150 m.

The Best Practice Guidance to PPS18 recommends that, "shadow flicker at neighbouring offices and residential properties within 500 m should not exceed 30 hours per year or 30 minutes per day". There are no offices or residential properties within 500 m of the Proposed Development turbines, so the Proposed Development is in compliance with this recommendation.

The results shows that there are properties where the total predicted hours exceed 30 per year. However the nearest turbines to all the properties are located far beyond the 500 m distance referenced in the guidance, so the effects are likely to be reduced. This is because at distance, when all other conditions allow, the wind turbine blades do not cover the sun but only partly mask it, substantially weakening any potential shadow.

It should be emphasised that the analysis provide an extremely conservative estimate of the extent that houses will be affected by shadow flicker, because:

- The analysis assumes that there is always sufficient lack of cloud cover, for there to be sufficient sunlight for shadows to be cast by the turbine;
- The analysis assumes that there is always enough wind for the turbine blades to be turning;
- The analysis assumes that the wind is always coming from the right direction for the turbine rotor to be facing towards the house, to thus cast a shadow;
- The analysis assumes that the property has windows and/or glazed doors facing towards the turbine;
- The analysis assumes there is no shielding, e.g. in the form of trees or outbuildings, between the turbine and the property.

Therefore, the actual amount of shadow flicker seen in these areas is likely to be much less.

In the event of shadow flicker causing a nuisance a range of mitigation measures can be incorporated into the operation of the wind farm to reduce the instance of shadow flicker. Mitigation measures include planting tree belts between the affected dwelling and the responsible turbine(s) or installing blinds at the effected property. In the unlikely event that

there is extreme nuisance mitigation could include shutting down individual turbines during periods when shadow flicker could theoretically occur.

Mitigation measures can be incorporated into the operation of the Wind Farm to reduce the instance of shadow flicker. Mitigation measures include planting tree belts between the affected dwelling and the responsible turbine(s) and shutting down individual turbines during periods when shadow flicker could theoretically occur

Taking all this into account the effects of shadow flicker are not considered to be significant.

Socioeconomics

This chapter presents estimates relating to the direct, indirect and induced benefits that could be generated by the construction and operation of the Proposed Development. It also provides a brief discussion on the unquantifiable benefits associated with a development of this type and scale, and the current macroeconomic and socioeconomic environments.

The chapter concludes that the Proposed Development will provide a much-needed boost of activity to both Derry City & Strabane District Council, and the regional economy. Job creation and economic activity will result throughout its construction, with a strong likelihood of local labour involvement. Both the construction and operational phase will generate increased tax and business rates revenue payable to central, regional and local Government.

It can also bring about catalytic benefits which can in turn attract further investment into Northern Ireland. For example, the knowledge, expertise and skills accumulated can act as a contributing factor to future investments in the area. Other local areas within Northern Ireland may also benefit as a result, helping to reduce the inequality across the region. Funding for such developments is usually project specific and involve a considerable amount of sunk cost. Therefore, if the Proposed Development does not take place the benefits, including the catalytic impact, are unlikely to be realised elsewhere in the Northern Ireland economy.

The proposed development would aid the Northern Ireland Assembly in meeting its climate target of 80 percent of electricity demand being met by renewable energy by 2030. With an estimated annual electricity production of almost 280 GWh, the proposed wind farm could provide electricity equivalent to the needs of over 80,000 homes each year, or almost 10 percent of the total current housing stock across Northern Ireland. Additionally, the proposed wind farm could reduce CO_2 emissions by 118,000 tonnes each year.

The proposed wind farm is estimated to involve a capital spend of approximately £101 million in nominal prices. Of this total, £35 million would be realised within the regional economy. The projected construction phase is estimated to create or sustain 290 total (direct, indirect and induced) job years of employment, £8.1 million of wages, and £20.3 million of GVA to the Northern Irish economy.

The estimated total (direct, indirect, and induced) annual benefits realised in Northern Ireland by the operational phase of the proposed wind farm includes 9 jobs, £280,000 of wages, and £840,000 in GVA.

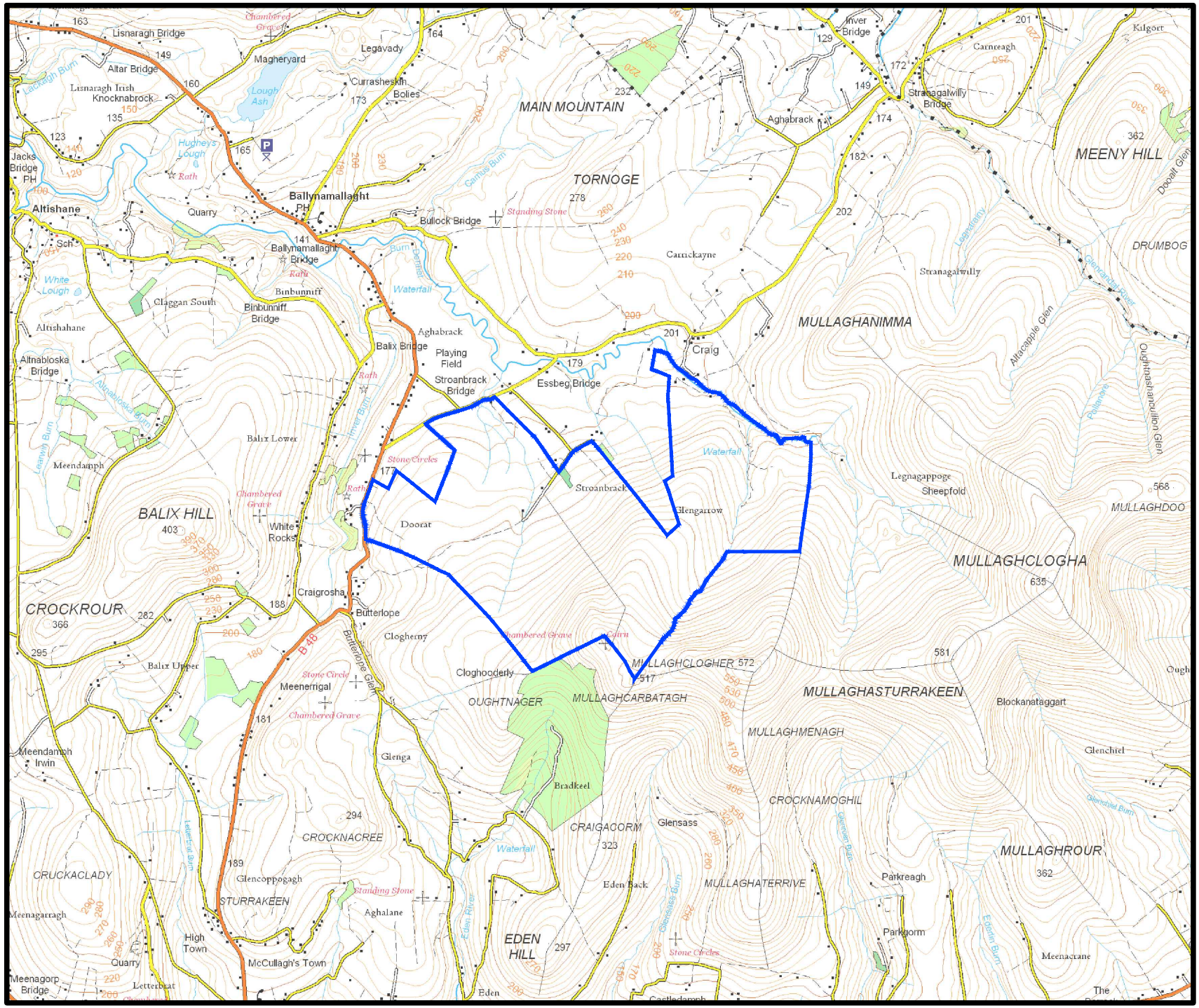
Conclusion

The potential effects of the Proposed Development have been assessed in accordance with regulatory requirements and good practice. The ES incorporates technical assessments of the Proposed Development based on the requisite legislation and the relevant planning policy framework. The ES has demonstrated that significant environmental effects associated with the construction, operation and decommissioning of the Proposed Development have been avoided or minimised through the use of the iterative design process and with the application of mitigation measures.

The amount of electricity that could be produced by the Proposed development is estimated at almost 280 GWh, the proposed wind farm could provide electricity equivalent to the needs of over 80,000 homes each year, or almost 10 percent of the total current housing stock across Northern Ireland. Additionally, the proposed wind farm could reduce CO_2 emissions by 118,000 tonnes each year.

The Proposed Development will result in a reduction in greenhouse gas emissions from the electricity generating industry by harnessing wind as an alternative to the burning of fossil fuels, in line with the government's energy goals.

Figures



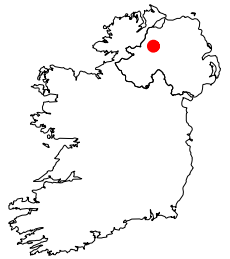
MULLAGHCLOGHER WIND FARM

FIGURE 1

SITE LOCATION

KEY

LAND UNDER APPLICANT CONTROL



SITE LOCATION - NOT TO SCALE

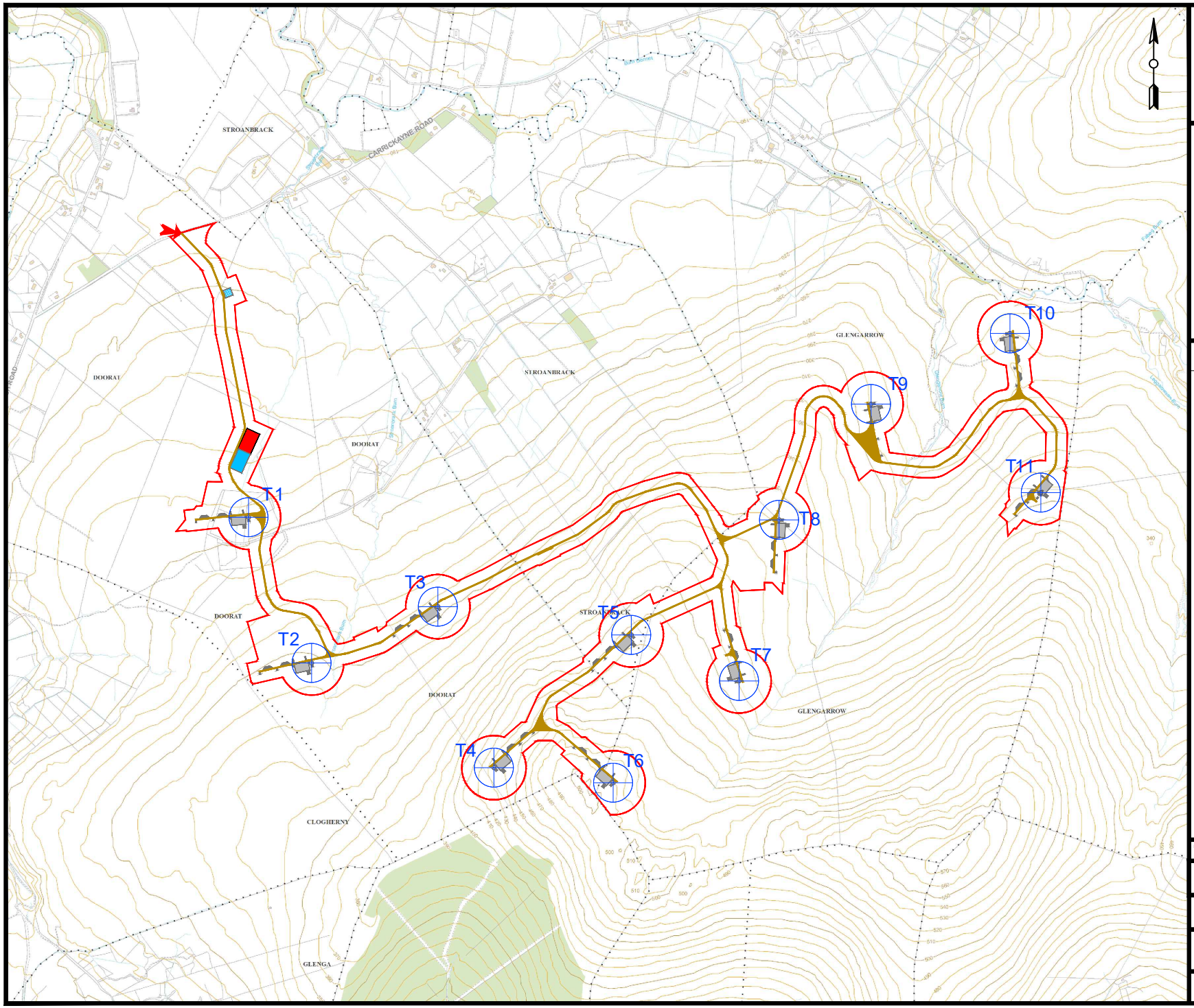
LAYOUT DWG	T-LAYOUT NO.
N/A	N/A

DRAWING NUMBER: 04398-RES-MAP-DR-XX-001

REV: 4

SCALE - AS SHOWN @ A4

NON-TECHNICAL SUMMARY 2025



MULLAGHCLOGHER WIND FARM

FIGURE 2

INFRASTRUCTURE LAYOUT

KEY:

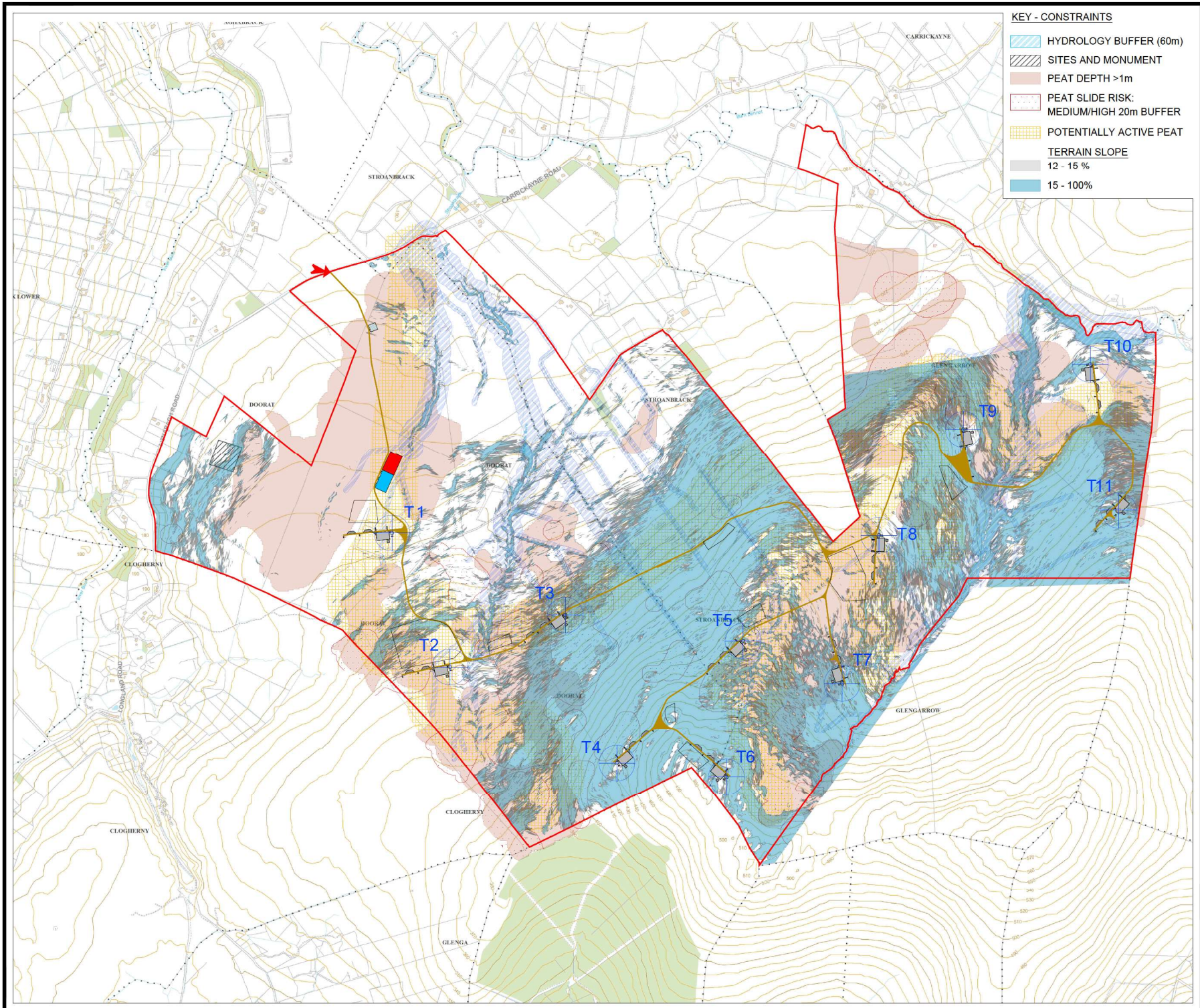
- PLANNING APPLICATION BOUNDARY
- TURBINES
- UPGRADED SITE TRACKS
- NEW SITE TRACKS
- WATERCOURSE CROSSING
- CRANE HARDSTANDING AREA
  - PERMANENT
  - TEMPORARY
- TEMPORARY ENABLING WORKS COMPOUND
- TEMPORARY CONSTRUCTION COMPOUND/ PERMANENT BATTERY STORAGE COMPOUND
- SUBSTATION COMPOUND
- SITE ENTRANCE

LAYOUT DWG	T-LAYOUT NO.
N/A	N/A

DRAWING NUMBER	REV
04398-RES-LAY-DR-PE-001	1

SCALE - 1:20,000 @ A4

NON-TECHNICAL SUMMARY 2025



MULLAGHCLOGHER WIND FARM

FIGURE 3

COMBINED CONSTRAINTS & INFRASTRUCTURE LAYOUT

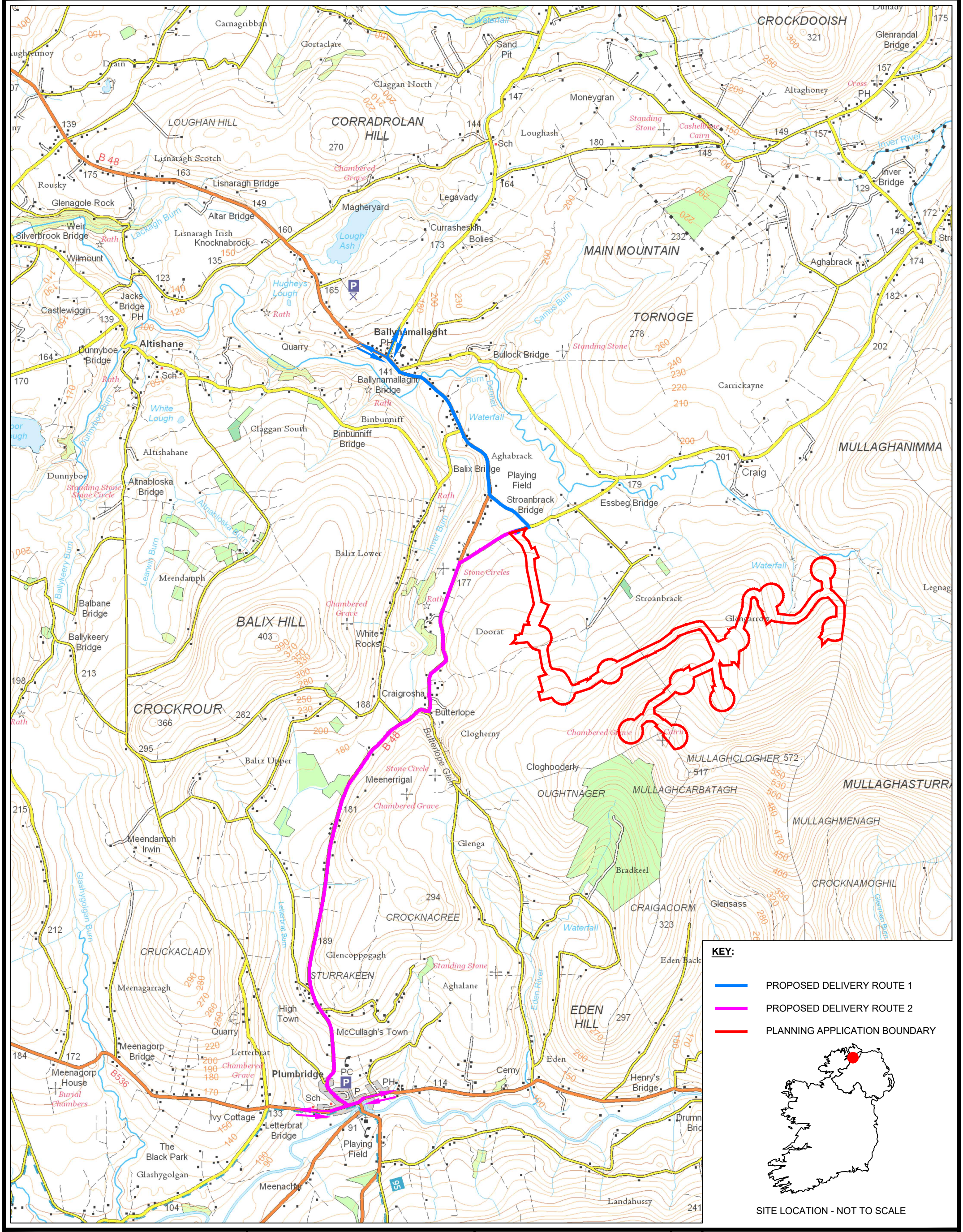
KEY:

- SITE BOUNDARY
- TURBINES
- UPGRADED SITE TRACKS
- NEW SITE TRACKS
- WATERCOURSE CROSSING
- CRANE HARDSTANDING AREA
  - PERMANENT
  - TEMPORARY
- TEMPORARY ENABLING WORKS COMPOUND
- TEMPORARY CONSTRUCTION COMPOUND
- BATTERY STORAGE COMPOUND
- SUBSTATION COMPOUND
- SITE ENTRANCE

LAYOUT DWG	N/A
T-LAYOUT NO.	N/A
DRAWING NUMBER	04398-RES-LAY-DR-XX-001
REV	1

SCALE - 1:15,000 @ A3

NON-TECHNICAL STATEMENT 2025



KEY:

- PROPOSED DELIVERY ROUTE 1
- PROPOSED DELIVERY ROUTE 2
- PLANNING APPLICATION BOUNDARY

SITE LOCATION - NOT TO SCALE

res

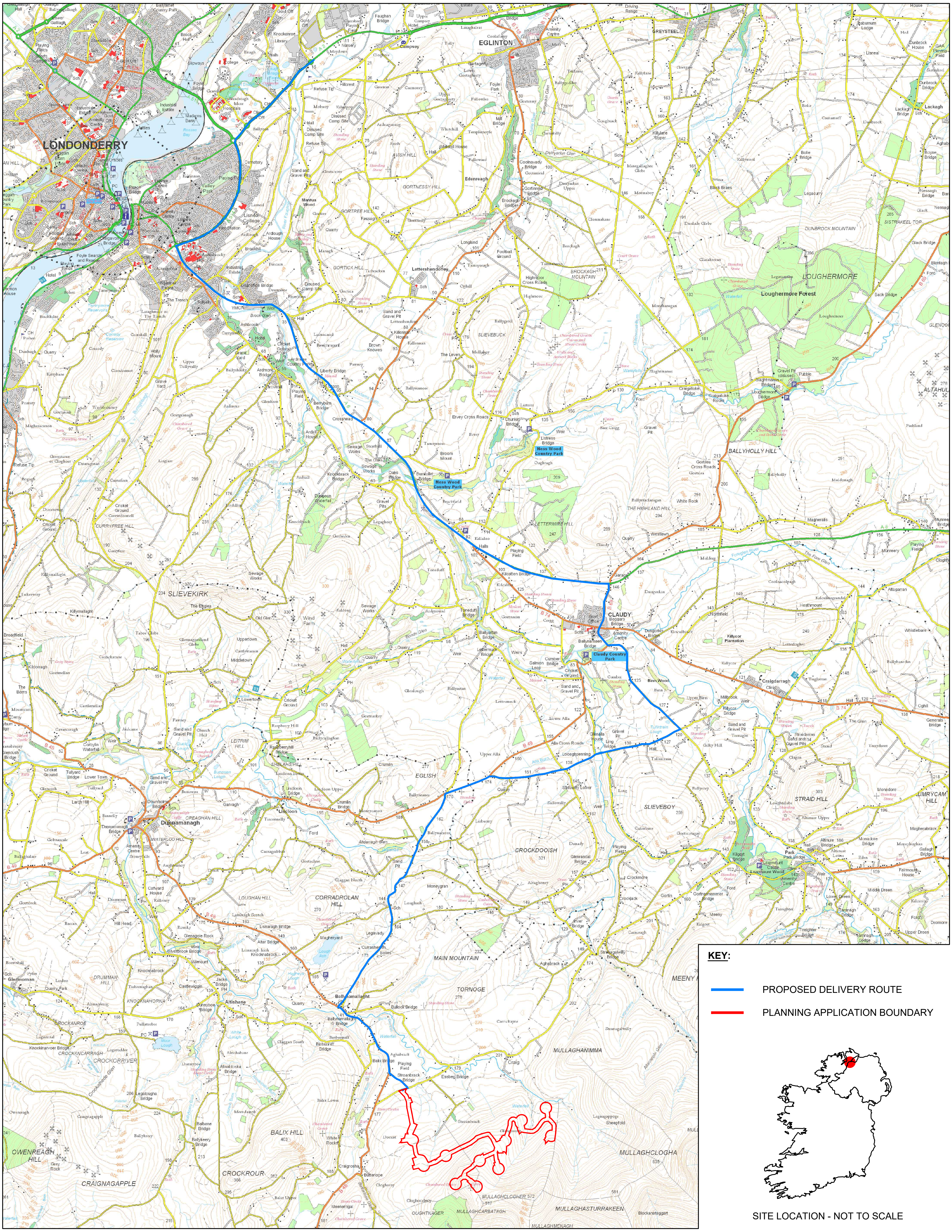
MULLAGHCLOGHER WIND FARM

FIGURE 4

HGV DELIVERY ROUTES

DRAWING NUMBER: 04398-RES-ACC-DR-LO-012	REV: 1
LAYOUT DWG: N/A	T-LAYOUT NO.: N/A
SCALE: 1:35,000 @ A3	

NON-TECHNICAL SUMMARY 2025



MULLAGHCLOGHER WIND FARM

FIGURE 5

TURBINE DELIVERY ROUTE

DRAWING NUMBER	04398-RES-ACC-DR-LO-006
REV	1
LAYOUT DWG	N/A
T-LAYOUT NO.	N/A
SCALE	1:75,000 @ A3

NON-TECHNICAL SUMMARY
2025