CLIENT: COOLPOWRA FLEX GEN LIMITED

PROJECT NAME: COOLPOWRA

PROJECT DETAILS: PROPOSED DEVELOPMENT OF A RESERVE GAS-FIRED GENERATOR, ENERGY STORAGE SYSTEM FACILITY AND GIS SUBSTATION IN THE TOWNLANDS OF COOLPOWRA, COOLDORRAGHA, COOLNAGEERAGH BALLYNAHESKERAGH, GORTLUSKY, AND SHEEAUNRUSH, CO GALWAY

DOCUMENT: ENVIRONMENTAL IMPACT ASSESSMENT REPORT (EIAR) NON-TECHNICAL SUMMARY (VOLUME 1)

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1 INTRODUCTION

1.1 OVERVIEW

Coolpowra Flex Gen Limited (CPFL) are applying for planning permissions to develop grid-connected energy support projects on lands with an area (redline boundary) of 42.3 hectares (ha) (105 acres) in the townlands of Coolpowra, Cooldorragha, Coolnageeragh, Ballynaheskeragh, Gortlusky and Sheeaunrush, County Galway.

The proposed development is designed to increase security of supply and keep the electricity grid stable and reliable in the face of growing demand. The development includes different flexible technologies, which were chosen to compliment and support the integration of further renewable generation technologies, such as offshore wind, whilst managing the associated effects of hourly and seasonal variations when wind and solar generation are insufficient. The proposed development not only supports the immediate energy needs but also plays a vital role in ensuring Ireland meets its carbon budgets from now until 2040. This approach positions the electricity sector to progress towards achieving the zero net carbon target and climate neutrality by 2050.

1.2 SUMMARY OF PROPOSED DEVELOPMENT

The proposed development is comprised of three individual projects. These are:

- Project 1: Reserve Gas-Fired Generator,
- Project 2: Energy Storage System (ESS), and
- Project 3: Gas Insulated Switchgear (GIS) Electricity Substation.

The development is considered of significant economic importance at both state and regional levels due to its strategic positioning on the 400kV transmission network. The proposed GIS substation (Project 3) will upgrade and enhance the existing AIS intermediate substation on the 400kV line at the Oldstreet node and will facilitate and provide for connection of the Reserve Gas-Fired Generator (Project 1) and Energy Storage System (Project 3) projects to the 400kV electricity network. A summary of each project is provided below.

1.2.1 PROJECT 1: RESERVE GAS-FIRED GENERATOR

The Reserve Gas Fired Generator comprises three open cycle gas-fired generator (OCGT) units positioned within a building (OCGT Hall) along with auxiliary equipment. An OCGT unit consists of a turbine connected to an electric power generator and the three turbines

are designed to operate independently of each other. The OCGT units will receive natural gas from the gas network via an underground pipeline to an Above Ground Installation (AGI) compound within the development lands. Gas Networks Ireland (GNI), as the designated competent authority, will separately manage the process of delivering the underground gas transmission pipeline to the proposed AGI within the proposed development lands.

The proposed OCGT units are dual fuel units as required by system requirements required by the Grid Code published by Eirgrid. Natural gas will be the primary and combustion fuel to each of the OCGT units when operating. Secondary fuel (gas oil) will be stored in a bunded structure outside the OCGT building along with ancillary items of electrical plant and machinery such as coolers and transformers. The Reserve Gas-Fired Generator is designed to operate intermittently and provide generation capacity during periods of high demand or when renewable energy generators cannot meet system demand. OCGT units are advantageous due to their operational flexibility and can be turned on quickly to match system demand. The selected OCGT units are capable of being converted to allow for the combustion of biomethane and /or a blend of natural gas with green hydrogen (>30%), which will further assist in meeting climate-neutral targets.

1.2.2 PROJECT 2: ENERGY STORAGE SYSTEM (ESS)

The Energy Storage System (ESS) facility comprises (a) a Long Duration Energy Storage (LDES) static battery positioned within a secure outdoor compound, and (b) a Synchronous Condenser which will operate within a building in a separately secured compound. The LDES will provide peaking, active power and back start capability services to the electricity grid. The project is designed to complement and support the reserve gas fired generator by providing zero carbon, instantaneous and balancing power to the grid.

1.2.2.1 Long Duration Energy Storage (LDES)

Battery storage is a technology that enables power system operators and utilities to store energy for later use. A battery energy storage system (BESS) is an electrochemical device that charges (or collects energy) from the grid or a power plant and then discharges that energy at a later time to provide electricity or other grid services when needed. A BESS facility is made up of batteries, a battery management system, a power conditioning system, and an energy management system.

The plant will absorb and inject energy as demanded by the power system. Therefore, it should be distinguished that grid-connected BESS plants do not operate continuously like conventional power fossil fuel power plants. BESS plants are designed to economically

and rapidly provide arbitrage and system support services when needed, allowing immediate system recovery.

1.2.2.2 Synchronous Condenser

Synchronous condenser technology has been around since the mid 1900's and is demonstrated and mature technology having been formerly used by utilities worldwide. The rotating generator is connected to the transmission system via a step-up transformer. The synchronous condenser is started up and stopped by a frequency controlled electric motor (pony motor). An inverter (static start device / startup frequency converter) is used to drive the generator to reach the operating speed and synchronises it with the system frequency. Once synchronised it acts as a motor providing reactive and short circuit power to the electricity network. There is no combustion or emissions from a synchronous condenser. The synchronous condenser will provide short-circuit power, inertia, and reactive power for dynamic loads and stabilise the network through voltage recovery during faults.

1.2.3 PROJECT 3: GAS INSULATED SWITCHGEAR (GIS) ELECTRICITY SUBSTATION

The Gas Insulated Switchgear (GIS) Electricity Substation comprises a two-storey building positioned and secured within a palisade fenced compound. This component of the overall development will enhance and upgrade the existing Oldstreet AIS 400kV substation and will provide for the connection of Project 1 and Project 2 to the electricity transmission network. The High Volage (HV) lines and electric plant associated with Reserve Gas Fired Generator and ESS facility, and which will connect the projects to the GIS substation, are included with the planning application for Project 3.

1.3 APPLICANT COMPANY

The Applicant Company, Coolpowra Flex Gen Limited, is part of the Lumcloon Energy Limited (LEL) group of companies which was established in November 2008 as a project development company focused on flexible power and energy assets. The company is based in Tullamore, Co. Offaly. At an early stage, LEL identified flexibility as a key component to address the changing needs of the evolving power systems which are transitioning from fossil-based generation to renewable-based generation. Since its inception, LEL has focused on the development of flexible generation and energy storage systems in Ireland plant to compliment the integration of renewable energy sources and assist to assist the transition to a decarbonised power source. LEL has developed a large portfolio of flexible generation and energy storage system facilities and is a founding

member of the Irish Energy Storage Association (IESA), which was established to promote the benefits of energy storage in Ireland.

1.4 NEED FOR THE DEVELOPMENT

The Irish Government has committed that up to 80% of electricity consumption will come from renewable sources by 2030[1] and that the country will be on a pathway to achieving a climate neutral net zero target by 2050. The use of electricity will also contribute to the decarbonisation of the transport sector, through the uptake of electric vehicles, and the heat sector, through the use of heat pumps. Ensuring continued security of electricity supply is considered a priority at national level and within the overarching EU policy framework in which the electricity market operates.

On the 30 November 2021, the Department of the Environment, Climate and Communications (DECC) issued a Policy Statement on Security of Electricity Supply. The Statement sets out a number of updates to national policy in the context of the Programme for Government commitments relevant to the electricity sector, planning authorities and developers. The policy statement includes explicit Government approval that the development of new conventional generation (including gas-fired and gasoil/distillate-fired generation) is a national priority and should be permitted and supported in order to ensure security of electricity supply and support the growth of renewable electricity generation. Conventional generation should be flexible and low emitting (i.e., powered by natural gas). The policy statement acknowledges that such gas-fired generation should also be able to operate on gasoil/distillate as a backup fuel.

The CRU has statutory responsibility to ensure security of supply, the duty of monitoring electricity supplies and taking measures as it considers necessary to protect the security of supply. It is assisted in its role by EirGrid, the electricity transmission system operator, and the Department of Energy Climate and Communications (DECC). In May 2024[2] the CRU issued a direction to stakeholders including Eirgrid and ESB Networks DAC to provide a pathway to grid connection for onshore units in the T-4 Capacity Auction for 2028/29 with the objective of mitigating the risk of capacity shortfall.

The CRU's Information Paper on Security of Electricity Supply – Programme of Actions (CRU/21/115) highlights the need to secure 2GW of enduring capacity in the form of new gas-fired generation and is aligned with the Government's Policy Statement on Security of

[1] Climate Action Plan 2024
[2] https://cruie-live-96ca64acab2247eca8a850a7e54b-5b34f62.divio-media.com/documents/CRU202437_CRU_Direction_to_EirGrid_T-4_2028-29_393003.PDF

Electricity Supply[3] and the Climate Action Plan 2024.[4] The CRU notes the Government's Policy Statement on Security of Electricity Supply, which states the following:

> *"The Government has approved that:*
> *the development of new conventional generation (including gas-fired and gasoil/distillate-fired generation) is a national priority and should be permitted and supported in order to ensure security of electricity supply and support the growth of renewable electricity generation;*
>
> *it is appropriate for additional electricity transmission and distribution grid infrastructure, electricity interconnection and electricity storage to be permitted and developed in order to support the growth of renewable energy and to support security of electricity supply".*

Similarly, the CRU notes the General Policy Directive[5], pursuant to Section 79 of the Environmental Protection Act, from January 2023, which calls for the prioritisation of *"the consideration of applications which impact on the State's energy security of supply."*

The location of this proposed development was guided by a number of factors not least being the existence of the adjoining 400kV AIS substation and the availability of sufficient and suitable lands within a location with low environmental sensitivities. In terms of rationale applied in respect of the scale and design of the proposed development which includes the Reserve Gas-Fired Generator Project (3No. 385MW OCGT units), the LDES (400MW) and Synchronous Generator (400MVA electrical rating) Project, the electricity system requires flexible gas-fired generation capacity and ESS facilities to assist the system with inertia, voltage stability, reserve and other technical elements. The requirement for the technologies proposed as part of this development is because the majority of renewable energy generated by 2030 and beyond will be from wind and solar. These sources of renewable energy are variable in nature will require other technologies to both support their operation and provide the supply of electricity when they are not generating. In addition, the significant growth in electricity demand projected over the coming years from large energy users, electrification of heating and transport and because of growing population underpin the need for development such as that proposed.

In terms of the proposed 400kV GIS which will facilitate connection of Projects 1 and 2 to the 400kV system, the CRU recognises the vital importance of the physical delivery of grid

[3] https://www.gov.ie/en/publication/a4757-policy-statement-on-security-of-electricity-supply/
[4] https://www.gov.ie/en/publication/79659-climate-action-plan-2024/
[5] https://www.gov.ie/pdf/?file=https://assets.gov.ie/245631/487f19aa-446a-4cea-8592-409bd7224b50.pdf#page=null

infrastructure to both decarbonisation and security of supply, and that this is also a key tenet of the REPowerEU plan. In this context, the CRU considers it appropriate to expedite connection works associated with connection offers issued under its May 2024 Direction and it accepts that the benefits to customers of this approach outweigh the potential risks.

1.5 PLANNING & DEVELOPMENT REGULATORY FRAMEWORK

Each of the three projects proposed as part of development at the subject site require separate planning applications.

The Reserve Gas-Fired Generator (Project 1) falls within the remit of Section 37A of the Act. Following consultations with An Bord Pleanála ("the Board" or "ABP") under Section 37B of the Act, the Board determined that the project falls with the scope of paragraphs 37(A)(2)(a) and (b) of the Act. Accordingly, the Board decided that the proposed development would be strategic infrastructure within the meaning of Section 37A of the Act and any application for permission for the project must be made directly to the Board under Section 37E of the Act.

The applicant was advised that the Energy Storage System (ESS) facility (Project 2) does not fall within the scope of Section 37A of the Act and that planning consent be sought from Galway County Council under Section 34 of the Act. A preplanning meeting was also held with Galway County Council and the proposed approach was also discussed and agreed (Galway County Council Ref. 24PP51).

Preapplication SID consultation was undertaken with ABP regarding the GIS Electricity Substation (Project 3) proposal. The Board decided that Project 3 falls within the remit of Section 182A of the Act and would be strategic infrastructure within the meaning of Section 182A of the Act and any application for permission for the project must be made directly to the Board under Section 37E of the Act. The HV lines and electric plant associated with Reserve Gas Fired Generator (Project 1) and ESS facility (Project 2), and which will connect these projects to the GIS substation, are included with the planning application for Project 3.

1.6 EIA AND EIAR

In Irish legislation, Section 172 of the Act establishes the requirement for an Environmental Impact Assessment (EIA), stating that:

> *"An environmental impact assessment shall be carried out by the planning authority or the Board, as the case may be, in respect of an application for consent for proposed development where either—*

(a) the proposed development would be of a class specified in—

(i) Part 1 of Schedule 5 of the Planning and Development Regulations 2001, and either—

(I) such development would equal or exceed, as the case may be, any relevant quantity, area or other limit specified in that Part, or

(II) no quantity, area or other limit is specified in that Part in respect of the development concerned,

or

(ii) Part 2 of Schedule 5 of the Planning and Development Regulations 2001 and either—

(I) such development would equal or exceed, as the case may be, any relevant quantity, area or other limit specified in that Part, or

(II) no quantity, area or other limit is specified in that Part in respect of the development concerned,

or

(b) (i) the proposed development would be of a class specified in Part 2 of Schedule 5 of the Planning and Development Regulations 2001 but does not equal or exceed, as the case may be, the relevant quantity, area or other limit specified in that Part, and

(ii) it is concluded, determined or decided, as the case may be by a planning authority that the proposed development is likely to have a significant effect on the environment."

The classes of development where an EIA is mandatory are specified in the Planning and Development Regulations 2001, as amended ("the Regulations") pursuant to Section 176 of the Act. The Regulations outline the regulatory framework for planning and development activities in Ireland and provide detailed procedures and requirements for various aspects of planning and development, including the need for Environmental Impact Assessments (EIAs). Specifically, Schedule 5 of these regulations sets out specific thresholds for various types of projects. If a project exceeds these thresholds, an EIA must be carried out as a mandatory requirement. Where a project is of a type listed in the regulations but does not meet or exceed the applicable threshold then the likelihood of the project having significant effects on the environment should be assessment. Criteria to evaluate whether significant effects on the receiving environment will arise from a proposed development are listed under Schedule 7 of the Regulations.

The Proposed Development includes a Reserve Gas-Fired Generator (Project 1) with a nominal electrical output of 1,155MW. This exceeds the following threshold in Part 1 of Schedule 5 of the Regulation and therefore an EIA is mandatory.

2. (a) A thermal power station or other combustion installation with a heat output of 300 megawatts or more.

As an EIAR for Project 1 (Reserve Gas-Fired Generator) is mandatory, a single EIAR has been prepared for the entirety of proposed development. Whilst EIAR is mandatory only in the case of Project 1, the EIAR includes all three project components of the proposed development. This was done following preplanning consultation with the relevant planning authorities and consideration of the scale, nature and location of Project 1 by itself and in combination with the two other adjoining projects proposed by the applicant[6]; i.e., an energy storage system project (Project 2) and a HV GIS electricity substation (Project 3). This single EIAR accompanies each of the three planning applications and the potential environmental impacts and effects from each project are assessed individually and cumulatively within the EIAR.

This EIAR has been prepared in accordance with the following:

- EU Directives 2011/92/EU as amened by 2014/52/EU,
- Planning and Development Act 2000 (As amended),
- Planning and Development Regulations 2001 (as amended),
- European Commission (EC) (2017), *"Environmental Impact Assessment of Projects - Guidance on the preparation of the Environmental Impact Assessment Report"* (Directive 2011/92/EU as amended by 2014/52/EU),
- Environmental Protection Agency (2022), *"Guidelines on the information to be contained in Environmental Impact Assessment Reports",*
- Environmental Protection Agency (2003), *"Advice notes on current Practice (in the preparation of Environmental Impact Statements)"*,

In accordance with the requirements of the EIA Directive electronic notification was provided to the Department of Housing, Local Government and Heritage about the applications for inclusion on the EIA portal.

[6] Refer to Section 1.1 (Overview) and 1.4 (Planning Framework) of the EIAR for further information.

2 DESCRIPTION OF THE PROPOSED DEVELOPMENT

2.1 LOCATION

The proposed development is located on a 42.3 hectares (ha) (105 acres) site in the townlands of Coolpowra, Cooldorragha, Coolnageeragh, Ballynaheskeragh, Gortlusky and Sheeaunrush, County Galway (see Figure A.1 and **Figure A.2**). The site is located approximately 5km north of the town of Portumna and 3.7km south of Killimor.

Lands within the development site boundary are in agricultural use and include a farmhouse and outbuildings which will be demolished as part of development works. The proposed lands are situated at an elevation of c. 51-54m AOD and are accessed by public road via the N65 (National Road) and the L8763 (local road). The three project compounds within the site are positioned c.500 m west of the N65, with an internal site access road providing connection to the public road (L8763). The proposed development is located adjacent to, and south of, the existing operational 400kV AIS electricity substation (Oldstreet). The proposed site was chosen as the preferred site following analysis of alternative sites along the two 400kV transmission lines, which traverse the country from west to east. The proposed site adjoins the Moneypoint to Woodland[7] 400kV line and the Oldstreet intermediate 400kV AIS substation (the only one) along this line.

The proposed development includes for the demolition and removal of a residential property (see Figure 2.1) within the site which contains a single storey house, associated outhouses and farm sheds.

Figure 2.1 Aerial view of Existing Residential Property

[7] The Woodlawn substation incorporates a connection to the East West Interconnector (EWIC). The East West Interconnector (EWIC) is a high-voltage direct current submarine and underground power cable which links the electricity transmission grids of Ireland and Great Britain and facilitates growth in renewable energy.

The construction and laydown area, as shown on the overall site layout plan, will be provided for all projects described as part of the proposed development. The principal contractor will secure the area with temporary fencing, set up initial site accommodation and welfare facilities, and temporary services. It is envisaged that existing services serving the residential property on site will be altered to serve the contractors construction compound.

2.2 PROPOSED DEVELOPMENT

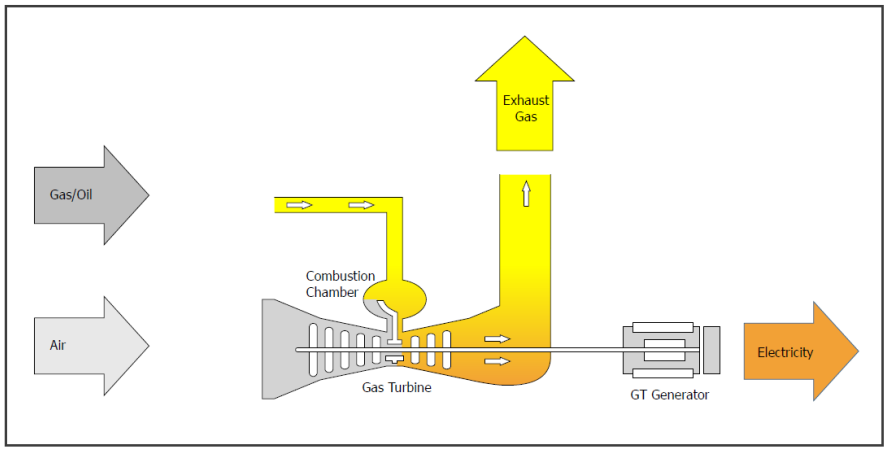
The following provides a summary of the proposed development.

2.2.1 RESERVE GAS-FIRED GENERATOR - PROJECT 1

The Reserve-Gas-Fired Generator comprises three OCGT units fuelled by natural gas with a nominal electrical output of 1,155MW. The plant will operate as a *'peaking plant'*, spending most of its time on standby, and will be run by 100% available to run as and when required by the electricity system operator to support and compliment renewable power generation technology. It is envisaged that the project will have a design life of at least 25 years (this is based on design life of the chosen technology). The OCGT units will be capable of being modified to adapt to the future introduction of hydrogen blended fuel in the Irish network.

Combustion turbines in open cycle (or simple cycle) configuration utilise a single thermodynamic cycle called the Brayton cycle. In the Brayton cycle, the working fluid (e.g., air) is compressed, heated, expanded through a turbine to turn the shaft (rotor) and is then discharged. The shaft drives the generator to produce electricity and the compressor to provide a continuous source of compressed air to the combustor. The combustion turbine exhaust gas, at slightly above atmospheric pressure, flows through a diffuser before discharging through a vertical stack into the atmosphere.

Figure 2.2 Open Cycle Process



OCGT units are advantageous due to their operational flexibility and can be turned on quickly to provide peak load. The reserve gas-fired generator is designed to get to full load in less than 20 minutes and can synchronise within five minutes. OCGTs exhaust residual heat to atmosphere at a temperature of approximately 544°C, unlike combined cycle gas turbines (CCGTs) where exhausted heat is recycled to generate steam and ultimately additional electricity. The OCGT units have a typical energy efficiency of 38-41%. It is proposed to position the OCGT units within a building (see Figure 2.3).

Figure 2.3 Architect Image of Proposed Reserve Gas-Fired Generator Building

The main components of the Reserve Gas-Fired Generator Project are as follows:

- OCGT building and adjoining administration block The OCGT building will contain:
  - 3no. open cycle gas turbine (OCGT) modules (each having a nominal electrical output of 385MW),
  - 3no. 45m high stacks positioned within outer enclosures designed to minimise heat transfer, discolouration of structures and abate noise,
  - Fire suppression skid and distribution system– inert gas

  - 3no. recessed, and roof mounted, air intake filter houses and ducts to intake air before filtering it to remove suspended particles and delivering it to the gas turbines,
  - CEMS mounted on the stacks to monitor and control stack emissions,
  - Power control centre and balance of plant (BoP),
- Administration block adjoining the OCGT building and containing control room, administration and welfare facilities,
- AIS compound north of the OCGT building containing electrical wires and associated plant,
- Fin fan coolers to provide cooling (air cooling of water contained within a closed loop) to the gas turbine lube oil, generators and transformers,
- Secondary fuel (gas oil /distillate) storage tanks (3no. containing 19,000 tonnes) positioned within a secondary concrete storage bund, fuel unloading area, fuel polishing unit and air compressor,
- Containerised emergency generators (3no.),
- AGI compound – gas receiving station,
- Main and auxiliary transformers,
- Workshop and stores,
- Firewater tank fire suppression skid,
- Site drainage which includes firewater storage tank, oil interceptors, stormwater, attenuation pond, culverting, crossings and proprietary foul pack treatment plant,
- Underground cabling and pipework,
- Ancillary components including cark parking, internal roads, lighting, fencing and gates, utilities, lightning protection masts, and associated works.

2.2.2 PROJECT 2: ENERGY STORAGE SYSTEM (ESS)

The Energy Storage System (ESS) facility comprises (a) a Long Duration Energy Storage (LDES) static battery (400MW) positioned within a secure outdoor compound, and (b) a Synchronous Condenser (400MVA electrical rating) which will operate within a building in a separately secured compound.

The LDES facility comprises a total of 224 modular single storey battery enclosures and medium voltage power stations (MVPS) and an IPP building. Both LDES facility will connect to the proposed GIS substation using electric plant (including step-up transformer) and HV cables. The proposed 168no. battery enclosures (12.2m long x 2.3m wide) and 56no. MVPS enclosures (6.1m long x 2.4m wide) will be positioned on concrete plinth foundations. Once positioned the top of the battery enclosures will be a height of 4.42m above the finished ground level (FGL) of the BESS compound and the top of the MVPS

enclosures will be a height of 3.29m above the compound FGL. The enclosures will be connected by underground ducts and cables.

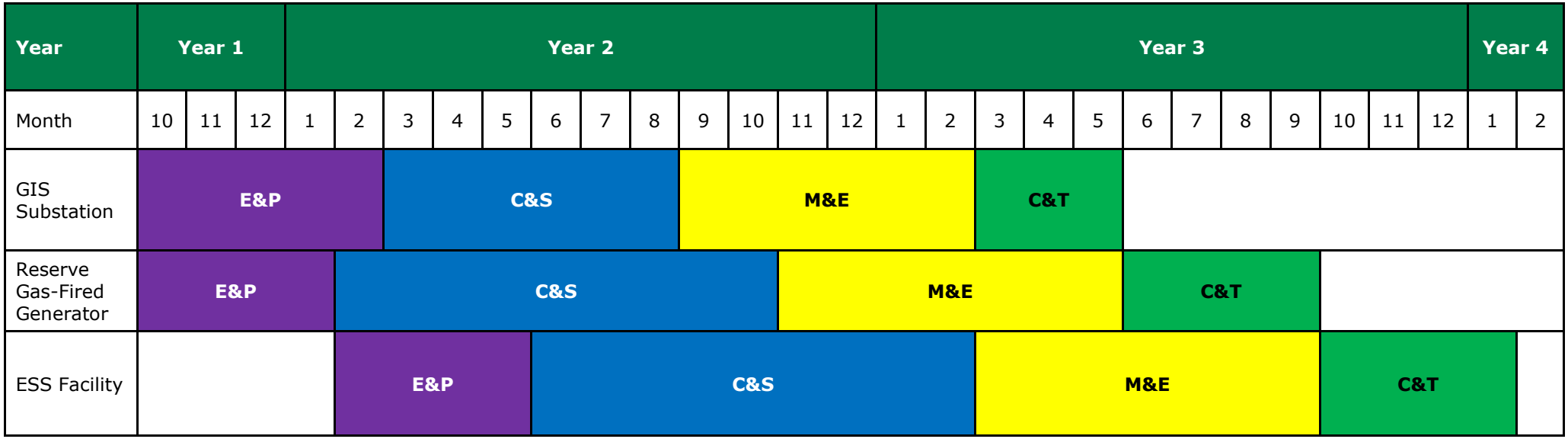
Figure 2.4 Image showing typical arrangement of LDES enclosures

The Synchronous Condenser uses a generator to provide the necessary inertia with its rotating mass while also providing or absorbing reactive power. The generator is connected to the transmission network by a transformer and is started by either an electric motor or a static frequency converter. Once operating speed is achieved, the generator is synchronized with the network and behaves like a synchronous motor with no load, providing reactive power and short-circuit power to the transmission network. The synchronous condenser compound includes a building (46m (l) x 22.7m (w) x 14.42m (h)), which will contain the horizontal synchronous generator unit along with control modules. It is expected that this building will be a portal steel frame structure. Associated externally located equipment includes an air-cooling unit for the generator, electrical plant (such as transformers), a fire water storage tank and a below ground foul wastewater holding tank.

2.3 CONSTRUCTION STAGE

It is envisaged that the proposed development (three projects) will be constructed over an estimated 20–28-month period. The specific details of the construction programme are not currently known as such this programme will be developed under Engineering Procurement and Construction (EPC) contract as part of the detailed design phase. Employment levels across the projects will vary depending on the construction programme and the extent of activities occurring on the site. It is expected that during peak activities, there will be up to 150 construction workers at the site. An indicative construction schedule for each project relative to each other is outlined below (Figure 2.5).

Figure 2.5 Indicative Construction Programme



Notes:

1. The construction timelines are for each project are indicative and will be finalised at detailed design stage of the projects.
2. In relation to GIS Project, timings of certain tasks /works will be subject to system outage planning by Eirgrid and EBS Networks.
3. Construction of the gas pipeline is non-contestable works and will be carried out by GNI.
4. E&P = Site Evaluation and Preparation (Works)
   C&S = Civil & Structural (Works)
   M&E = Mechanical & Electrical (Works)
   C&T = Commissioning and Testing (Works)

2.4 OPERATIONAL STAGE

The Reserve Gas-Fired Generator will only run during periods of high demand or system instability and in accordance with the needs of the system operator. The project will employ approximately 15-20 full-time personnel who will work across three daily shifts. Periodic engineering and maintenance inspection visits to the plant will also be carried out. When called upon, it is expected that the plant will respond and reach full load within 20 minutes and generate electricity for export to the grid. The Reserve-Gas Fired Generator will require an industrial emissions licence from the EPA (i.e., it falls under a class of activity ("*Combustion of fuels in installations with a total rated thermal input of 50 MW or more*") as outlined in the first schedule of the EPA Act 1992, as amended.

The ESS facility (LDES and Synchronous Generator) will operate unmanned and will be controlled remotely. The storage systems will respond to system demand and provide a wide range of balancing and system support services. The Project is not a class of activity under the First Schedule of the EPA Act 1992, as amended.

The GIS substation will enhance and upgrade the existing Oldstreet AIS 400kV substation and will provide for the connection of Project 1 and Project 2 to the electricity transmission network. Similar to the ESS facility, the station will operate unmanned. Once developed, ownership of the proposed GIS Project will transfer to ESB Networks (ESBN) (as transmission asset owner (TAO)). The GIS will upgrade and reinforce the existing node on the electricity system and will be operated by Eirgrid (as transmission system operator (TSO)). It is proposed that ESBN and Eirgrid will access the asset via the existing road which provides access the Oldstreet AIS substation.

Upon handover after the Commissioning and Testing Phase, the plant operators will provide suitably qualified and technically competent staff who will be responsible for maintenance of the plant. Employees will cover a broad range of services including safety, engineering, technical, security, maintenance and administrative support staff. Subcontracted maintenance staff will also be required at critical times such as an annual shutdown period. The projects will be operated in accordance with procedures which will be prescribed in management systems associated with the site operations, i.e., quality, health and safety, energy and environmental.

2.5 CONTROL OF MAJOR ACCIDENT HAZARDS (COMAH)

The Chemicals Act (Control of Major Accident Hazards involving Dangerous Substances) Regulations 2015 (S.I. No. 209 of 2015) (the "COMAH Regulations") implement the Seveso III Directive (2012/18/EU) and aim to prevent and mitigate the effects of major accidents

involving dangerous substances which can cause serious harm to people and/or the environment, with the overall objective of providing a high level of protection in a consistent and effective manner. An Environmental Risk Assessment (ERA) and Consequence Assessment Study of the proposed development was carried out by DNV Services UK Limited and are presented in Volume 3 of the EIAR; Appendices 4.1 and 4.2 respectively. The ERA concludes that the following installation of design controls the level of mitigated risk posed by development is broadly acceptable. The semi-quantitative risk assessment undertaken as part of the Consequence Assessment Study concludes that there are no offsite impacts associated with the proposed development and the safety risk from the proposed is tolerable.

2.6 APPROPRIATE ASSESSMENT

A Stage 1 AA screening of the proposed development was completed which concluded that there was a need for Stage 2 AA and preparation of a Natura Impact Statement (NIS). A single NIS has been completed for the proposed development and is provided under separate cover in support of each planning application. It is the conclusion of this NIS with the implementation of the mitigation and restriction measures set out that the possibility of any adverse effects on the integrity of the European Sites considered in this NIS (having regard to their conservation objectives), or on the integrity of any other European Sites (having regard to their conservation objectives,) arising from the proposed development, either alone or in combination with other plans or projects, can be excluded beyond reasonable scientific doubt.

3 CONSIDERATION OF ALTERNATIVES

3.1 DO NOTHING SCENARIO

The CRU and Eirgrid have issued warnings to Government about the risk of blackouts. Ongoing system analysis shows that the all-Ireland capacity margin is insufficient, particularly when renewable generation is at a low output and support is not available. This has been exacerbated in recent times due to closure (and pending closure) of older conventional thermal generators and increases in system demand. In the event of system emergency conditions or imminent shortfall of MW capacity, the Single Electricity Market Operator (SEMO) issues colour-coded alerts. Depending on seriousness of events, alerts are issued to informing stakeholders of the possibilities of failure in meeting the power system demand, frequency or voltage departing significantly from normal, shutdown of users, or shutdown of the power system (partial or full). As of early May 2024, SEMO has issued 22 system alerts since May 2021 (three years) to warn of capacity shortages on the electricity grid, compared with just 11 alerts over the previous 10 years[8].

The proposed development provides a mix of technological solutions designed to provide a wide range of grid support services and to assist with the transition to a low carbon economy. In the absence of the proposed development, integration of renewable energy generators will be constrained, security of supply will continue to be threatened and decarbonisation of the generation portfolio will be inhibited, thereby impeding Ireland's commitment to meet its EU and national emissions targets. In the absence of the proposed GIS substation (Project 3), the option and provision of connecting Project 1 and Project 2 directly connect to the electricity transmission system and export power to the grid would not have been considered and assessed.

3.2 ALTERNATIVE TECHNOLOGIES

A mix of technologies were chosen for the proposed development to provide a comprehensive range of grid products and to assist with the transition to a low carbon economy. Open cycle gas turbine (OCGT) technology, also referred to as simple cycle gas turbine technology, was chosen for the Project 1 to address the current emergent needs for support generation capacity reflected by the T-4 Capacity Auction, and the closure of peat and impeding closure of coal and diesel plants in Ireland. The chosen technology type will be capable of providing predicable dispatchable power and a range of "on-state" and "off-state" electricity system services.

[8] https://www.businesspost.ie/energy/electricity-system-amber-alert-issued-this-morning-f772c7e6

As part of the assessment of the electricity substation option, a gas insulated switchgear (GIS) substation and an air insulated switchgear (AIS) substation were considered. In general GIS substations are positioned indoor and AIS substations are installed outdoors. The main advantage of the GIS substation is that the phase to phase spacing is reduced significantly resulting in a substation with a much smaller compound footprint than its AIS counterpart. Noise impacts is mitigated with equipment being internally located, and visual and landscape impacts are also reduced. In terms of the energy storage element of the ESS project, a number of battery types were considered. This included lead acid, flow battery (iron, vanadium) and NaS batteries. Criteria which informed selection of the preferred technology included, proven and demonstrated technology, long life cycling requirements and positive environmental and safety attributes. The LDES is capable of providing a wide range of system services[9] which support the integration and further growth of nonsynchronous renewable generation. The synchronous condenser provides reactive power consumption and generation resulting in voltage control, short circuit power capacity and inertia response.

3.3 ALTERNATIVE LOCATIONS

The site was chosen as the proposed development location due to:

a) the existence of the adjoining 400kV Oldstreet AIS substation (the only intermediate substation along the route of this 400kV line) at the proposed development lands,
b) the availability of sufficient and suitable lands (under the control of the applicant) with low environmental sensitivities,
c) sufficiency of buffer distances to residential properties,
d) suitable ground conditions,
e) lands are accessible from the public road, no material conflicts with zoning objectives, and
f) being able to demonstrate conformance with planning policy.

Developing the proposal at this location avoids and reduces adverse environmental effects (following the mitigation hierarchy of avoid, reduce and, if possible, remedy) such as routing HV overhead lines to a development site removed or distant from the existing HV corridor. It ensures that the above ground development[10] is consolidated and substantially improves cost benefit analysis of the proposed development.

[9] SIR, FFR, POR, SOR, TOR1, TOR2, SSRP, RRS, RRD, RM1, RM3, and RM8
[10] It is noted that an underground gas transmission line will be extended to serve the proposed development. However, extension of the gas transmission network in the region conforms with development policy as outlined in Chapter 3 of this EIAR

3.4 ALTERNATIVE LAYOUTS

Once the preferred site was selected, the design team focused on suitably positioning a proposal within the site that is sympathetic and one which integrates into the landscape and surrounding environment. The final design concept was, as far as practicable, to minimise visual intrusion and accordingly the proposed finished compound levels were determined following careful consideration of cut and fill requirements and existing local topographical conditions. The Project compound finished levels were set to reduce the overall height of the development within its setting whilst carefully considering other potential knock-on effects, such as cut and fill imbalance, waters, etc. During the EIA process baseline surveys were carried out and design mitigation measures were incorporated into the overall scheme. Various design layout options were developed to minimise potential impact on sensitive receptors) and accord with the natural features of the site (e.g., topography). Extensive consideration was also given in relation to devising suitable access to the proposed development and mitigating potential impacts.

4 PLANNING AND POLICY

The developments were assessed in the context of the following:

- National Policy; including the National Development Plan 2021-2030 and Energy, and Climate Change Policy.
- Regional Policy; Regional Spatial and Economic Strategy (RSES) Northern and Western Region (NWRA) 2020-2032
- County and Local Policy; Galway County Development Plan 2022-2028

There is significant policy support for low carbon energy production and sustainable improvement and expansion of the electricity transmission system to provide for future economic growth at national, regional and county level. The proposed development conforms with policy objectives by significantly improving national security of electricity supply and supporting the growth of renewable electricity generation (government target of 80% renewable sources by 2030[11]). Achieving net zero carbon dioxide emissions by 2050 (and achieving climate neutrality by 2050[12]) requires significant and unprecedented changes to Ireland's energy system. Infrastructure such as the electricity grid must be built, offshore wind needs to progress, large-scale investment must be sought, renewable fuels found, and homes and businesses transformed. To overcome the intermittency issue arising from the variable nature of wind energy, and to maintain the reliability and continuous operation of the power system in times of low resource availabilities, renewable generators need to be combined with low carbon emitters and storage technologies such as the technologies proposed.

The development will deliver a nationally significant quantum of low carbon flexible, fast start-up generation capacity to the grid via the existing node (Oldstreet) on one of the two 400kV transmission lines which traverse the country from the west delivering power to the east coast of Ireland.

The siting of proposed development conforms with the principles of proper planning and sustainable development given its adjoining location to the 400kV HV electricity network and existing 400kV Oldstreet node. The proposal is compatible with the overarching framework of plans and policies and supports and promotes sustainable improvements and the transition to a net zero and climate neutral economy.

[11] Climate Action Plan 2024
[12] There are different interpretations of the term climate neutrality. The EU Climate Law aligns it with achieving net zero greenhouse gas emissions by 2050. The Climate Action and Low Carbon Amendment Act 2021 interprets a "climate neutral economy" as a "sustainable economy and society where greenhouse gas emissions are balanced or exceeded by the removal of greenhouse gases"

5 POPULATION AND HUMAN HEALTH

5.1 INTRODUCTION

While there are a range of issues which may impact on human beings many of these have been considered within other disciplines within this EIAR, including Planning Policy (Chapter 4), Water Environment (Chapter 8), Air Quality (Chapter 9), Noise and Vibration (Chapter 11), Landscape and Visual (Chapter 12), Traffic and Transport (Chapter 13). Cultural Heritage (Chapter 14) and Climate (Chapter 15).

5.2 DESCRIPTION OF THE RECEIVING ENVIRONMENT

The proposed development lands are located in southeast Galway, approximately 4.5km north of the town of Portumna. The development lands are within Galway County Council's jurisdiction (see Figure 5.1). The proposed development lands are located in the Loughrea MD. According to the CSO (2022) the population of Galway County Council is 193,323.

Figure 5.1 Galway County Council Area

The subject development lands are located the electoral division (ED) of Portumna, which has a population of 2,540 people. The largest settlement in the ED is the town of Portumna, which has a population of 1,450 people. The ED of Killimor adjoins the northern boundary of Portumna ED and has a population of 702 people of which 336 live in the settlement of Killimor. Loughrea and Ballinasloe are the closest settlements with populations greater than 5,000 people. Both settlements are approximately 20km from the proposed development lands.

The number of persons enumerated in 2016 by CSO in the townlands which the proposed development lands are located (see Figure 5.2) is presented in Table 5.1.

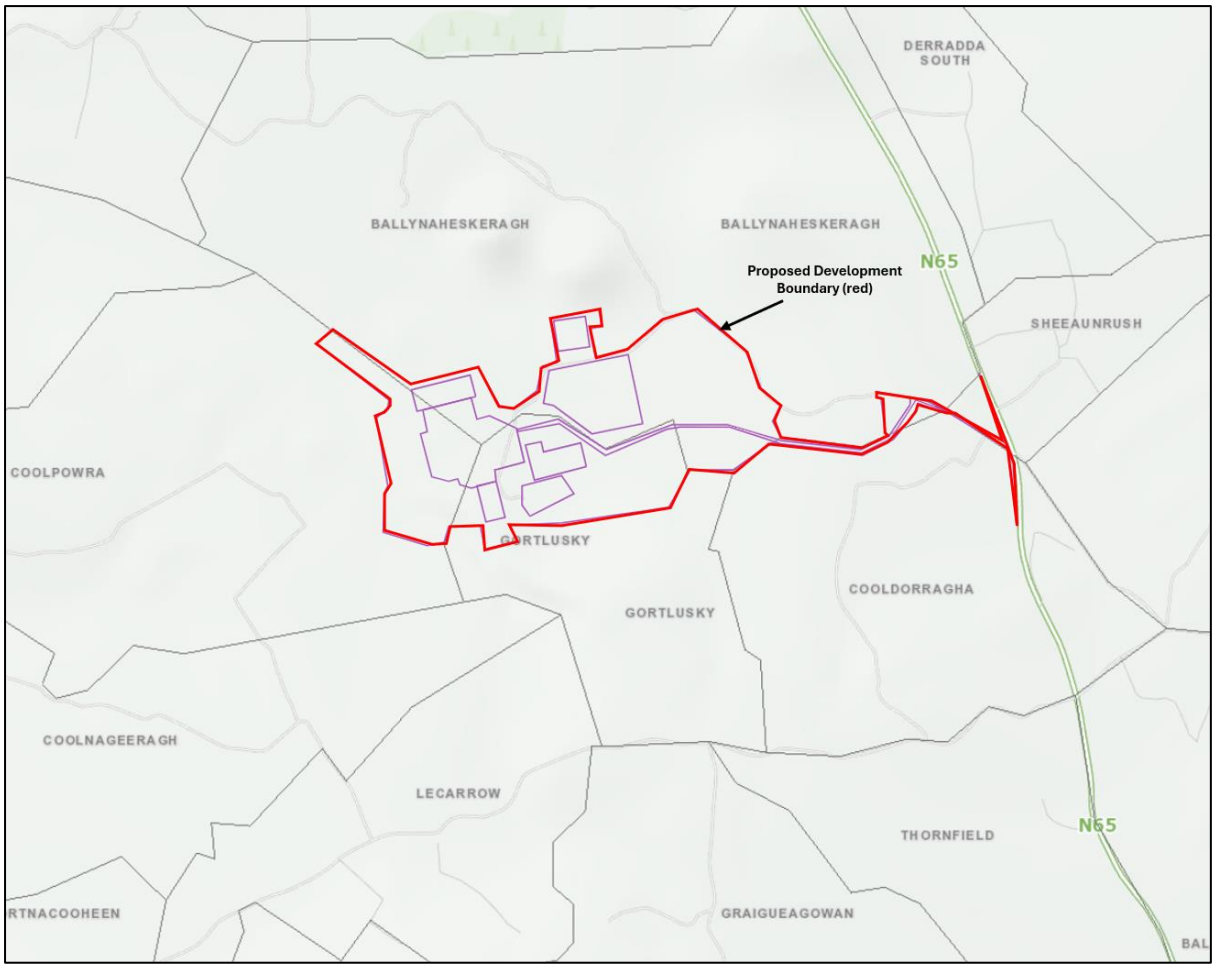
Table 5.1 Townland Populations

Townland	Number of People
Coolpowra	21 people
Cooldorragha	0
Coolnageeragh	31 people
Ballynaheskeragh	16 people
Gortlusky	Value suppressed[Note 1]
Sheeaunrush	Value suppressed[Note 1]

Note 1 OSI report that values are supressed in the following cases:

- The number of permanent, private households in the Townland is 1 or 2.
- All the population in the Townland is male or all the population is female.
- No permanent private households and the population is greater than 0.

Figure 5.2 Setting – Townlands



The area in which the proposed development site is located is typical productive rural landscape that is not rare or distinctive at a national or regional level. The are a limited number of residential properties within the surrounding rural area and these are described as one-off housing with a total of 40 recorded within 1km offset from the main development with the proposed development lands. The proposed lands are situated at an elevation of c. 51-54m AOD and are accessed by public road via the N65 (a National Road which is a notable landuse in the study area) and the L8763 (a local road which runs along an esker ridge beyond the northern boundary of the site).

The proposed development lands are not zoned. The development lands are currently in agricultural use (grazing and tillage) and are owned privately[13]. The existing Oldstreet 400kV substation is one of the more notable single land uses within the study area and was an important criterion in the selection of the proposed development site.

5.3 ASSESSMENT OF EFFECTS

This project does not contain a housing or services element and is not considered to have any direct positive or negative impacts on the local or regional population levels. However, the plant will attract employees who are not based in locally to relocate to the town to reduce commuting distances. During the construction phase there is the potential for limited impacts on the residential amenity of the local population. The overall impact is considered to be imperceptible in terms of population. Temporary /short term slight adverse impacts associated with an increase in traffic (construction) levels will likely occur. With the recommended traffic and transport mitigation measures in place, no significant adverse roads and traffic related environmental impacts are anticipated during the construction, operational or decommissioning phases of the proposed development.

A Stage 1 Road Safety Audit has been carried out in accordance with TII's publication *'GE-STY-01024 – Road Safety Audit'* and is included under the Traffic and Transport Appendix. All issues raised in the Road Safety Audit have been addressed so the proposed development will be satisfactory in terms of traffic operations and safety. The proposed improvements and upgrades to the N65/L8763 and to the Oldstreet AIS substation will have a positive long term moderate effect.

The ERA undertaken concludes that the following installation of design controls the level of mitigated risk posed by development is broadly acceptable. The semi-quantitative risk assessment undertaken as part of the Consequence Assessment Study concludes that

[13] The proposed development

there are no offsite impacts associated with the proposed development and the safety risk from the proposed is tolerable.

5.4 MITIGATION

Post mitigation impacts to population and human health during the construction (and decommissioning stages) of the proposed development are predicted as short-term, direct and indirect slight effects.

Based on the assessment findings presented in all Chapters of the EIAR which have interactions with Population and Human Health, the proposed development will give not rise to any profound or significant population and human health effects. The significance of potential effects on identified sensitive receptors associated with operation of the proposed development is in general considered negligible /imperceptible.

6 BIODIVERSITY

6.1 INTRODUCTION

This chapter provides an assessment of the impacts of the proposed development on the ecological environment, i.e., biodiversity, flora and fauna.

6.2 DESCRIPTION OF THE RECEIVING ENVIRONMENT

The site comprises a mosaic of open farmland fields (GA1) which are either heavily grazed or under Arable Crops (BC1). The fields are bordered by low gappy sections of Hedgerows with occasional semi-mature or mature trees. A list of habitats recorded, and their corresponding Fossitt codes is presented Table 6.1.

Table 6.1 Details of Habitats Recorded and their Corresponding Fossitt Codes

Habitat	Habitat Category	Habitat Type
(F) Freshwater	(FW) Watercourses	(FW1/4) Stream/Drainage ditches
(G) Grassland	(GA) Improved grassland	(GA1) Improved agricultural grassland
	(GS)	(GS2) Dry meadows and grassy verges
(W) Woodland and Scrub	(WS) Scrub and transitional woodland	(WS1) Scrub
	(WL) Linear woodland	(WL1) Hedgerows
		(WL2) Treelines
(B) Cultivated and Built land	(BC) Cultivated land	(BC1/3) Arable crops/Tilled Land
(B) Cultivated and Built land	(BL) Built land	(BL3) Buildings and artificial surfaces
(E) Exposed rock and disturbed ground	(ED) Disturbed ground	(ED1) Exposed sand gravel or till
		(ED3) Recolonising bare ground

There are no designated sites within the development site boundary. No invasive species were recorded during surveys.

The site is situated within the core sustenance zone of a known Common Pipistrelle maternity roost, located to the north of the site. No bat roost was found within the site. The bat survey report (Refer to EIAR Volume 3) concluded that post mitigation the proposed development will have no negative impacts on the local bat populations.

14 no. species of birds of interest were observed during fieldwork. 6 no. of these were identified as being red-listed; Barn owl, Kestrel, Meadow Pipit, Redwing and White tailed

eagle. Of these species the value of the subject site was identified as local medium for; Barn Owl, Kestrel, Meadow pipit, redwing and snipe.

Lapwing and Black-headed gull; conservation objectives of the middle Shannon Callows SPA were observed either flying over or in the hinterland. These were not interacting with the site. A juvenile White-tailed eagle was also observed. Impacts on these species will be negligible.

Mitigation measures proposed will reduce the impact on all bird species while enhancement measures should result in a net overall benefit for the local bird population. The proposed development will not have a significant impact on any bird species on a local or county basis. (Refer to EIAR Volume 3 for Bird Survey Report).

There were signs of fox recorded and a hare was observed in the western grassland fields. These species are of low ecological concern and are not protected. There were no signs of otters in the site or along the stream or drainage ditches which have no fisheries value. There were no badger setts along field boundaries which would be disturbed and no signs of badgers in the study area.

It is proposed to realign a portion of the Treananearla Stream within the site boundary. This will involve construction of a new channel, prior to altering the flow of the stream. Construction management of this portion of the Proposed Development to prevent any impacts on these two European sites. There is no potential for connectivity to any other European sites.

Overall, the proposed development area is of Low Local Ecological Value, with the exception of the Treananearla Stream west of the farmhouse bridge, and the esker hedgerows and treelines.

6.3 ASSESSMENT OF EFFECTS

The open field habitats are considered of low biodiversity value at a local level as are most of the internal hedgerows. The Treananearla Stream will be realigned, with features including meanders and fringing hedgerows to encourage a seminatural habitat. Approximately 330m of hedgerow, along the Treananearla Stream will be removed, along with sections of other internal hedgerows of low local value. This will be considerably outweighed by the planting of approximately 7,500m^2 native woodlands along the southern boundaries of the site, together with more biodiversity friendly management of remaining hedgerows, to give considerable biodiversity net gain.

Potential direct effects on breeding birds through loss of internal hedgerow can be avoided by appropriate timing.

The Treananearla Stream is of relatively low biodiversity value in terms of its topography being a relatively shallow water course with no potential for fisheries value. It has a variable course ranging from drainage ditch type to semi-natural. The realignment of the stream will be achieved by constructing a new landscaped water course with a more naturalised bed and enhancement features such as pea-gravel and increased meandering to create riffle and glide areas. The old water course will be diverted to the newly landscaped course with no significant loos of aquatic habitat. The diversion will be carried out having regard to the pathway to the Kilcrow River and Lough Derg much further downstream.

In the absence of mitigation measures during diversion and overall site development near water courses, the potential for pollution for elevated suspended solids and/or chemical spills or hydrocarbons is uncertain in the absence of construction management measures.

There will be a loss of c. 330m of hedgerow where the Treananearla Stream will be diverted to a new landscaped course. There will be a loss of c. 150m of hedgerow to the east of the farm buildings.

There will also be a loss of two sections of c. 30m to facilitate the new access road to the site. The overall cumulative loss of hedgerow will be c.540m.

This will be replaced by a linear band of woodland and wildflower meadow for a loped distance of 1.4km to the south of the site. Additional hedges will be placed around the AGI area to the north for c.100m. This provides an ecological corridor between the Oldstreet Compound and the old remaining access road into the site where existing hedges will be allowed to grow out to a less intensive management regime.

The potential direct effects on habitats will be imperceptible and neutral.

The Treananearla Stream will be realigned, with a new channel dug, prior to the diversion of the stream. Construction management will avoid any impacts on the hydrologically connected Lough Derg European sites.

Guidance on lighting has been based on the Bats & Lighting document; (BCI, 20 the Bats and artificial lighting in the UK Guidance Note 08/18 (BC T, 2018) and Guidelines for consideration of bats in lighting projects. EUROBATS Publication Series No. 8 (Voigt, 2018). Lighting can alter the behaviour of bats and the insects they prey on.

The potential direct effects on Biodiversity will be imperceptible and neutral.

6.4 MITIGATION

Potential impacts on birds will be avoided by cutting of vegetation outside the bird nesting season March 01 to August 31. If this cannot be enforced, then the site will be surveyed for the presence of nesting birds and/or nests prior to cutting and if none are recorded the vegetation may be removed within 48 hours.

Potential impacts on birds will be avoided by cutting of vegetation outside the bird nesting season March. Potential impacts on birds will be avoided by cutting of vegetation outside the bird nesting season March.

In order to minimise the extent of light spill onto perimeter habitats, all lights that are pole mounted will be directional and/or cowled to ensure that light is directed downward and inwards. Lights will be programmed or otherwise to be off unless required.

Mitigation measures proposed will reduce the impact on all bird species while enhancement (such as planting of nature woodland, SUDS features (ponds) providing habitat) and roost houses /bird boxes) measures should result in a net overall benefit for the local bird population. The proposed development will not have a significant impact on any bird species on a local or county basis.

6.5 SUMMARY OF SIGNIFICANT EFFECTS

There will be no significant effects on designated sites in the potential Zone of Influence of the proposed development.

There will be no significant effects on low value local biodiversity.

7 SOILS AND GEOLOGY

7.1 INTRODUCTION

This Chapter focuses on the soils and geology environment and discusses the potential impacts and effects associated with the proposed development.

7.2 DESCRIPTION OF THE RECEIVING ENVIRONMENT

The current land use is described as agricultural pastures. Soils at the site comprise the unconsolidated geological deposits which overlie the subsoil (i.e. the topsoil). The main soils across the development lands as classified by Teagasc are largely deep well drained mineral soil (mainly basic). The mapped sediments underlying the site are describe as *"Till derived from limestones"* in the western and southern areas of the site and *"Gravels derived from Limestones"* in the northern and eastern areas of the site.

The bedrock geology underlying the development lands is mapped as Dark Limestone and Shale ("calp") of Lucan Formation. The formation comprises dark-grey to black, fine-grained, occasionally cherty, micritic limestones that weather paler, usually to pale grey. There are rare dark coarser grained calcarenitic limestones, sometimes graded, and interbedded dark-grey calcar.

A groundwater abstraction well is located within the development lands to the east of the house which is to be demolished as part of the proposed development. The well is used as a potable water supply to the existing residence and to the farm buildings and surrounding farmlands (farm animal drinking troughs). No bedrock outcrops are identified by the GSI. It is envisaged that bedrock is close to the surface in parts of the site near the western area of the site. Aquifer vulnerability is classed as moderate with localised areas classed as high aligning with depth of overburden (*drift*).

As part of site assessment works a number of trial pits were excavated across the development lands to depths of c.2.7m below ground level (bgl). No bedrock was encountered in any of the trial pits excavated. No groundwater was observed within the trial pits. Soil description in recorded logs conforms with desktop findings. There are no karst features within or near (within 5km) the site. There are no sites of geological interest within or close to the development boundary.

7.3 CONSTRUCTION STAGE EFFECTS (PROJECTS IN ISOLATION AND IN COMBINATION)

Receptor sensitivity (soils and bedrock) was considered as Low. The impact of potential environment effects during construction of the projects in isolation and in combination were determined as being short term, minor to moderate (pre mitigation) and negligible following mitigation.

7.4 OPERATIONAL STAGE EFFECTS

The impact of potential environmental effects during operation of the projects in isolation and in combination (pre-mitigation) were determined as being moderate (pre-mitigation) for Project 1 (Reserve Gas-Fired Generator) and Project 2 (ESS) and minor (pre-mitigation) for the Project 3 (GIS).

7.5 MITIGATION

Post recommended mitigation, the potential effects are during construction and operation of the projects in isolation and in combination are considered negligible. The proposed developments will not have any significant residual effects on soils and geology post implementation of mitigation.

8 WATER ENVIRONMENT

8.1 INTRODUCTION

This Chapter focuses on the soils and geology environment and discusses the potential impacts and effects associated with the proposed development.

8.2 DESCRIPTION OF THE RECEIVING ENVIRONMENT

Lands within the development site boundary are in agricultural use and include a farmhouse and outbuildings. The proposed lands are situated at an elevation of c. 51-54m AOD and are accessed by road via the N65 (National Road which connects the towns of Loughrea and Portumna) and the L8763 (local road).

A summary of the soils and geology environment is provided below. Further details are presented in Chapter 7 of this EIAR. The two dominant sub-catchments in the area are the Gortaha (Catchment 025B), which drains to the east, and the Kilcrow (Catchment 025C), which drains to the west. These rivers are both part of the Lower Shannon Hydrometric Area. Following ground truthing it was established that the vast majority (main area of development works) of the proposal are contained in the Kilcrow_070 WFD subbasin (IE_SH_25K010700) of the Lower Shannon surface water catchment (Catchment ID 25C). There are several field boundary drains present within the site that contribute to the runoff at its downstream end.

The main watercourse within the developments is the Treananearla stream, which flows west and northwest through the development lands[14] before discharging to the Kilcrow River (1.9km to the west). There are two culverts in place along the central channel of the Treananearla stream within the site boundary. These provide road crossings for access to farmland and a dwelling (proposed to be demolished as part of works). Both culverts have a diameter of 950mm. The Kilcrow_070 River is classed as *"at risk"* and of *"moderate"* status (2016-2021). Benefitting land maps show that The Treananearla stream flowing through the site is maintained as part of the Killimor/Cappagh arterial drainage scheme. It is proposed to realignment part of this watercourse within the development lands.

The Sheeaunrush stream flows east beyond the main development areas within the proposed development land before its confluence with the Ballynaheskeragh stream on the northern side of the L8463. The waterbody then flows into the Gortaha River and

[14] The EPA map viewer (https://gis.epa.ie/EPAMaps/Water) incorrectly shows the watercourse as the Gortaha_010 and to be flowing east and southeast.

southeast for 6.1km before merging with the Lower Shannon, 1km north of Portumna Bridge.

The site falls within the Tynagh groundwater body which is bounded to the west, north and northeast by surface water catchments, to the southeast and south by Lough Derg. The bedrock aquifer is described as a Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones (LI). Groundwater vulnerability across the vast majority of the development lands is classed as *'Moderate'* vulnerability. An area of high vulnerability is shown to be present in the southwestern corner of the site where shallow bedrock is expected to be present. Groundwater flow is expected to follow topography, flowing generally south /south-eastwards.

A Stage 3 Flood Risk Assessment was undertaken to support the proposed development. The study concluded that the application site is currently in Flood Zone C and will remain in Flood Zone C following proposed works (i.e. not at risk of flooding). The proposed works will not result in an increased flood risk within the site or downstream of the site.

8.3 ASSESSMENT OF CONSTRUCTION STAGE EFFECTS

Receptor (surface water and groundwaters) was considered as Low. The impact of potential environment effects during construction of the projects in isolation and in combination were determined as being short term, minor to moderate (pre mitigation).

8.4 ASSESSMENT OF OPERATIONAL STAGE EFFECTS

The impact of potential environment effects during operation of the projects in isolation and in combination (pre mitigation) were determined as being moderate for the proposed development.

8.5 MITIGATION

Post recommended mitigation, the potential effects during construction and operation of the projects in isolation and in combination are considered short term negligible (construction) and long-term negligible (operation). The proposed developments will not have any significant residual effects on the water environment post implementation of mitigation.

9 AIR QUALITY AND CLIMATE

The proposed development for which planning permissions are sought includes a Reserve Gas-fired Generator, an Energy Storage System (ESS) and a 400kV GIS Electricity Substation. The potential air quality impacts on the surrounding environment that requires consideration for a proposed development of this type includes two distinct stages, the short-term construction phase and the long-term operational phase.

9.1 CONSTRUCTION PHASE IMPACTS

The impact assessment that was completed shows that the most significant potential impacts are those associated with excavation work and construction works which are dependent on weather conditions. Damp weather and low wind speeds will reduce the level of impact experienced at the receptor locations. There will be a temporary, slight impact on the closest receptors during the excavation works and a short-term, not significant impact on the closest receptors during the construction works. Construction traffic impacts will be not significant and experienced in the short-term. In the absence of mitigation measures, the overall impact of dust arising during the construction phase is considered to be short term in duration and its significance will vary from not significant to slight.

Potential emissions from construction traffic using the local road network have been assessed to contribute an imperceptible change to the existing air quality concentration and no material change in air quality relative to the existing situation is predicted.

9.2 OPERATION PHASE IMPACTS

The only predicted air quality impacts associated with operation of the development are emissions to atmosphere from the combustion of natural gas in the gas turbines. A comprehensive assessment was undertaken which demonstrated that with the chosen stack height of 45m that the predicted ambient air concentrations will be very significantly lower than the relevant air quality standards and therefore there will be no adverse impact on air quality, human health or on ecosystems as a result of the proposed development. The operational phase activities will have a not significant impact on local air quality and will be long-term in duration.

9.3 CUMULATIVE IMPACT ASSESSMENT

The cumulative impacts of this proposed development have been considered in conjunction with known other developments and existing activities in the immediate area. The air

quality impacts associated with the proposed developments will be well within the relevant Air Quality Standards. The impacts are deemed to be not significant and long-term.

9.4 MITIGATION MEASURES

A Dust Management Plan will be formulated for the construction phase of the project, as construction activities are likely to generate some dust emissions. The principal objective of the Plan is to ensure that dust emissions do not cause significant nuisance at receptors in the vicinity of the site. The design of the construction programme and the location and layout of the construction compound and the storage of materials will be carefully planned to ensure that air quality impacts are minimised.

9.5 RESIDUAL IMPACTS

Due to the size and nature of the development and the nature and volume of the potential emissions, the construction phase activities will have a not significant impact on climate and will be short-term in duration while the operational phase activities will have an imperceptible impact on climate and a not significant impact on air quality and will be long-term in duration.

10 MATERIAL ASSETS

10.1 INTRODUCTION

This Chapter of the EIAR evaluates the impacts, if any, which the development will have on material assets. Material assets are resources that are valued and intrinsic to the Site and the surrounding area. With regard to Material Assets, the 2022 EPA EIAR Guidelines ("EPA Guidelines") state:

> *"Material assets can now be taken to mean built services and infrastructure. Traffic is included because in effect traffic consumes transport infrastructure. Sealing of agricultural land and effects on mining or quarrying potential come under the factors of land and soils."*

Material assets of *natural origin* and the existing quality of natural resources such as air, water, soils, landscape, lands and soil, etc., are discussed in depth in earlier Chapters of the EIAR along with those of human origin such as traffic and transport infrastructure, soils, archaeological /architectural heritage and flood protection.

Material assets of natural and human origin which are included in this assessment are the following:

- Ownership and access
- Land Use
- Services
- Demolition works

10.2 DESCRIPTION OF THE RECEIVING ENVIRONMENT

The proposed development is located on a 42.3 hectares (ha) (105 acres) site in the townlands of Coolpowra, Cooldorragha, Coolnageeragh, Ballynaheskeragh, Gortlusky and Sheeaunrush, County Galway (See Chapter 2). The site is located approximately 4.5km north of the town of Portumna and 3.7km south of the village of Killimor. The town of Portumna is located on the northern shores of Lough Derg. The proposed lands are situated at an elevation of c. 51-54m AOD and are accessed by public road via the N65 (a National Road which is a notable landuse in the study area) and the L8763 (a local road which runs along an esker ridge beyond the northern boundary of the site). The main portion of development (compounds for the three projects) within the site is positioned 500 m west of the N65 with an internal site access road providing connection to the public road (L8763).

The proposed development is located on greenfield lands and are not zoned under the County Development Plan (white lands). The lands are not being used by the public and there are no public open spaces or community lands within or adjoining the lands.

There are no ground stability issues identified within the proposed development lands and there the historic landuse doesn't differ from its current use (agricultural).

There are no active or expired waste licences within the proposed development lands. The closest EPA licensed activity to the site is Green Isle Foods Limited (Reg. No. P0816-01) which is 4.7km south/southeast of the site. The activity is located on the south side of Saint Joseph's Road (R352), west of Portumna town centre and adjoins Portumna Forest Park. There are no other EPA licensed sites within a 5km radius of the site.

The proposed development is located adjacent to, and south of, the existing operational 400kV AIS electricity substation (Oldstreet). The existing Oldstreet 400kV substation is one of the more notable single land uses within the study area.

There will be no severance of land as a result of the proposed development or loss of rights of ways or amenities. The vast majority of the proposed development lands are privately owned. Relevant landowner consents letters associated with the development proposal are provided in Volume 3 of this EIAR. The applicant company has put in place agreements with relevant landowners associated with road improvement work at the N65 /L8763 junction. The proposed development lands are currently accessed via the L8763 which defines part of the northern boundary of the site. The proposed development includes construction of a new primary access to the development lands from the L8763.

A minor public road (L-87632-0), which is located beyond the northern redline boundary of the proposed development, provides access to a vacant residential property east of the Oldstreet AIS substation. It is noted that Eirgrid plc was granted planning permission (Galway County Council Ref. 23/60849) to construct *"Series Compensation Equipment"* on lands to the east of the Oldstreet substation. Works include for demolition of the existent vacant farmhouse and all associated farm outbuildings. The proposed development does not affect or impact this consented development. The proposed development will not affect or impact connection of the *Series Compensation Equipment* to the grid at Oldstreet.

The road serving the existing residential property within the proposed development lands includes a right of way in favour of Electricity Supply Board (ESB) and it provides access to the Oldstreet AIS Substation. No changes are proposed to the road with respect to the right of way. The proposed development has been designed so that when operational the proposed GIS substation will also be accessed using this road.

The proposed development includes for the demolition and removal of a residential property within the site, which comprises a single storey house, associated outhouses and farm sheds. The property is served by a septic tank for foul effluent and water is supplied from an on-site groundwater well. There are a limited number of residential properties within the surrounding area, and these are described as dispersed rural once-off housing comprising a combination of linear clusters of residential dwellings, small cross-road settlements and isolated farmsteads. There are a total of 40 recorded occupied residential properties within a 1km offset from the project compounds with the proposed development lands. The closest residential dwelling to the proposed development boundary is approximately 300m to the west of the development site.

Development of the proposed projects will not involve the installation of new infrastructure for the extraction of natural resources.

There are no readily available municipally owned infrastructure serving the proposed development lands – water supply pipe or sewer network. The existing on farm residence and farm activity is served by a groundwater well on site. Similarly foul wastewater from the existing residence is management and treatment by an on-site wastewater treatment system. The existing groundwater well will be used to serve the water requirements of the development proposals which are very low.

Foul wastewater which will be generated from the projects will be managed and treated using an onsite proprietary package wastewater treatment plant (domestic wastewater treatment system with a population equivalent ≤ 10) for Project 1. Sealed fould holding tanks will be used for Project 2 and 3; these will be maintained under service agreement with an approved contractor. Due to the nature, type of projects and future occupancy levels during operation, the volume of foul wastewater which will be generated is low.

In accordance with best practice, stormwater arising from development of impermeable surfaces (e.g., roof of buildings, roadways) stormwater will be collected and infiltrated to ground and or attenuated and discharged at greenfield run-off rates to the receiving watercourse traversing the site . Stormwater generated from oil risk areas (e.g., certain impermeable areas such as the secondary fuel storage bund) will pass through a Class 1 bypass petrol interceptor and grit trap prior to being discharged.

Minimal process wastewater will be generated during the operational phases of any of the projects. Any process wastewater (e.g. washings) will be collected and disposed of at a suitably waste authorised facility.

The development proposals will involve demolition and removal of a farm residence within the lands. The house, outbuilding and farm sheds, will be demolished and removed from site in accordance with best practice. Works will involve careful decommission and removal of all farm structures at the site. Anticipated wastes which will be generated include soils, bricks and blocks; concrete and reinforced concrete; timber; metal sheeting and steel. Materials arising from this process will be recycled /disposed of at authorised waste management facilities.

10.3 CONSTRUCTION AND OPERATION STAGE EFFECTS

Development of the projects will result in change of use of lands from agricultural to industrial use. Soils excavated as part of development works will be used within the overall development boundary to create landscaped berms in the northern and north-western areas of the site. The planted berm will be constructed to enhance the terrestrial ecosystem.

There are no direct or indirect negative effects on material assets. Proposed devleopment will positively benefit the electricity transmission system by providing a low carbon and carbon free secure and resilient supply of energy which is critical to a well-functioning economy. The Projects will also support and promote sustainable improvement and expansion of the electricity transmission.

In terms of potential environmental effect once operational, the impact on the environment from projects in isolation and in combination will be long-term, neutral and imperceptible.

11 NOISE AND VIBRATION

11.1 INTRODUCTION

An assessment of the impact on the ambient sound environment and related effects on receptors, (namely human beings), potentially arising, as a result of each of the proposed projects individually and cumulatively has been prepared. Potential for vibration impacts on nearby dwellings and occupants during site development and construction has also been undertaken.

11.1.1 METHODOLOGY

Comprehensive noise monitoring was undertaken in April 2024 over a period of five days at eight locations to characterise the receiving ambient sound environment in proximity to existing Noise Sensitive Receptors (NSRs). Both unattended long term and attended short-term measurements were undertaken. Monitoring was conducted in accordance with the requirements of The EPA Guidance Note for Noise: License Applications, Surveys and Assessments in Relation to Scheduled Activities, (NG4), revised January 2016.

The assessment of impacts and effects on human beings largely took account of guidance in the aforementioned NG4 document and also as provided in the following:

- BS5228-1:2009 +A1:2014: Code of Practice for Noise and Vibration Control on Construction and Open Sites: Part 1: Noise and Part 2: Vibration.
- Transport Infrastructure Ireland (TII) publication Guidelines for the Treatment of Noise & Vibration in National Road Schemes, March 2014.
- Guidelines for the Treatment of Noise and Vibration in National Road Schemes, Rev1, TII, (formerly National Roads Authority (NRA)), October 2004.
- UK Highways Agency Design Manual for Roads and Bridges, Sustainability and Environmental Appraisal, LA11, Noise and Vibration, Rev 2, May 2020.
- BS4142:2014 +A1:2019: Methods for Rating and Assessing Industrial and Commercial Sound.
- The predicted source specific noise levels at the nearest NSRs (40 No.) arising from the long-term operational phases for each of the proposed developments and cumulatively were calculated in accordance with ISO 9613-2-1996 - Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation where appropriate. DGMR iNoise 2024 software was used to predict free-field noise levels at the façade of the nearest NSRs.

11.2 ASSESSMENT OF POTENTIAL IMPACTS

The site and surrounding lands are mainly in agricultural use with detached residential dwellings located off local roads. The Oldstreet 400kV station adjoins the northern of the site. The main noise sources in the area are road traffic on the N65 national route, a distinctive sound from the Oldstreet substation transformers and typical rural intermittent noise sources. Traffic noise from the N65 dissipates with distance west of the site.

The monitoring undertaken indicates that the majority of NSRs, in proximity to the proposed development site are in areas classed as low background noise areas under NG4. Background noise levels at four long term monitoring points in proximity to NSRs are summarised below:

Period	$L_{A90,15min}$ arithmetic mean as required by NG4 & range (dB)			
	NMP1	NMP2	NMP3	NMP4
Daytime (07.00 - 19.00hrs)	37 29-43	42 36-48	35 29-49	32 27-45
Evening (19.00 – 23.00hrs)	32 26-38	30 20-43	32 25-41	28 24-32
Night-time (23.00 – 07.00hrs)	27 24-42	20 20-48	26 20-41	30 22-39

The results for continuous unattended monitoring at NMP1, 3 and 4 indicate that the majority of the nearest NSRs are in an area of low background noise as defined in Section 4.4.2 of NG4 as follows:

- Average Daytime Background Noise Level ≤ 40dB L_{AF90}, and;
- Average Evening Background Noise Level ≤ 35dB L_{AF90}, and;
- Average Night-time Background Noise Level ≤ 30dB L_{AF90}.

NMP2 did not satisfy all 3 criteria as the arithmetic average daytime background noise level (L_{AF90}) was ≥ 40dB. However, some of the lowest values for night-time background levels were recorded at this location. Noise levels at NMP1 were influenced by a continuous source located at the existing Oldstreet substation which was objectively identified as tonal at times at 315Hz. Hence background values were elevated due to this source although

noise levels were still below the average background noise threshold levels used to determine if an area is of low background noise during the day, evening and night.

11.2.1 ASSESSMENT OF SITE DEVELOPMENT AND CONSTRUCTION

In the short term, site development and construction works can potentially give rise to temporary elevated noise levels at NSRs through the use of mobile and non-mobile heavy machinery and equipment. An assessment of the site development and construction phase noise impact has been conducted in accordance with BS5228:1:2009+A1:2014 for each proposed development and cumulatively for all three. Predicted construction noise impact from each project is not expected to exceed a threshold value of 65 dB ($L_{Aeq,1hr}$) due to the intervening distance between equipment and NSRs. The impact magnitude rating is predicted to be temporary negligible negative for each project. Therefore, the effects are deemed to be insignificant.

The construction of the access route will form part of Project 1 and will potentially result in exceedance by up to 2 dB of the TII acceptable limit of 70 dB ($L_{Aeq,1hr}$) for road construction at the nearest NSR. The impact magnitude rating is temporary moderate negative in the absence of mitigation. However, to determine if a significant effect will occur, the duration of the impact should be considered. The total construction of the road element will be short within the overall programme. However, each individual step will move away from the nearest as road construction is linear in nature. Therefore, the duration will be temporary and typically will not be above the following:

- 10 or more days or nights in any 15 consecutive days or nights;
- A total number of days exceeding 40 in any 6 consecutive months.

Accordingly, a significant effect on any individual NSR arising from the proposed access road construction is not predicted to occur.

The effect of construction traffic on the access road has been considered. The impact has been determined as short-term negligible negative and the effect is deemed to be insignificant.

Potential construction impacts at NSRs are greatest within 40m of development works, after which they reduce as noise attenuates over distance. As addition of sources is logarithmic, the highest contributing sources i.e. generally those at close distances to NSRs predominate and tend to define the noise impact magnitude. The site preparation, earthworks and construction programmes for all 3 projects are expected to overlap at

times. However, due to the distance to NSRs the cumulative impact is not expected to differ from individual impacts already described.

It is unlikely that the proposed works will cause vibration impact due to intervening distance to receptors. No piling is proposed. HGVs on uneven surfaces such as the access route and the use of breakers and vibratory rollers during construction of the route may lead to transient vibrations. It not expected that vibration criteria will be exceeded at the nearest receptors, however precautionary measures are included in the mitigation measures.

11.2.2 ASSESSMENT OF OPERATIONAL PHASE

Specific noise levels have been predicted for each individual project and cumulatively at the nearest NSRs as summarised below.

Project	Predicted Noise Level Range $L_{Aeq,t}$ dB
1	16 - 34
2	15 - 33
3	No significant sources
Cumulative	18 - 35

The above predictions are based on all sources operating continuously. The following limits typically apply for areas of low background noise.

Scenario	Daytime Noise Criterion, dB $L_{Ar,T}$ (07.00 -19.00 hrs)	Evening time Noise Criterion, dB $L_{Ar,T}$ (19.00 – 23.00 hrs)	Night-time Noise Criterion, dB $L_{Aeq,T}$ 23.00 -07.00hrs)
Areas of Low Background Noise	45	40	35

Cumulatively, the overall project will comply with the lower limits for areas of low background noise at all NSRs. A BS4142: 2014+A1: 2019 assessment has been undertaken to determine if adverse or significant adverse impacts are likely taking account of existing low background levels. However, due to the intermittent nature of the proposed operation, it is considered that adverse or significant adverse impacts are not anticipated.

11.3 MITIGATION MEASURES

The following mitigation measures are proposed during the site development and construction phases:

- A Site Representative will be appointed for matters related to noise and vibration.
- Any complaints received will be thoroughly investigated.
- A written complaints log will be maintained by the Site Representative. This will, at a minimum, record complainant's details (where agreed) the date and time of the complaint, details of the complaint including where the effect was observed, corrective and preventative actions taken and any close-out communications. This will ensure that the concerns of local residents who may be affected by site activities are considered during the management of activities at the site.
- Specifically with regard to the access route construction potentially affecting NSRs to the southeast at the junction of the N65/L8763 the following measures apply:
- Noise monitoring with capability for real-time review both on-site and remotely will be conducted at the boundary points when works are planned in close proximity.
- In the event of meeting or exceedance of the threshold values at NSRs, works will be ceased and measures implemented immediately to ensure that the limits are complied with.
- Temporary acoustic screening or hoarding will be placed along the boundaries where possible with the proposed access route and the nearest NSR; - NSR36. As a general rule of thumb, it is recommended that temporary screening break the "line of sight" from the sources to the lower windows of the nearest NSRs where possible.
- The operation of certain pieces of equipment, where substitution, enclosure etc. cannot be carried out will be managed through monitoring and timing of use to ensure that noise levels remain below the threshold values/criteria specified.
- As a precautionary measure and as part of good practice, vibration monitoring will be carried out where works such as the use of rollers are in close proximity to NSR36 and other NSRs in the cluster located at the N65/L8763 junction.
- Measures such as the use of low noise plant and/or the use of enclosures will be chosen to minimise construction noise impact.
- During the construction phase all equipment will be required to comply with noise limits set out in EC Directive 2000/14/EC and the 2005/88/EC amendment on the approximation of the laws of the Member States relating to the noise emission in the environment by equipment for use outdoors. The directive covers equipment such as compressors, welding generators, excavators, dozers, loaders and dump trucks.

The outline CEMP submitted with this application shall include the noise management measures listed above.

In the long term, limits as specified earlier and standard conditions on tonality and impulsive noise will be complied with. The design includes:

- Enclosure of main OCGT sources within a turbine hall with an Rw value >50 dB,
- Blast walls to 9.55m partially enclosing the LV transformers,
- 7m absorptive barrier to the south and west on fin fan coolers,
- Reduction of stack emissions and air inlets to lower sound power levels based on technology providers experience on similar projects where technically feasible,
- Berms to 4.5m in height along the western, southern and eastern boundaries,
- Inverters facing inwards towards battery units.

The project will result in the upgrade of the existing Oldstreet Electricity substation. A tone at 315 Hz was noted during the baseline survey. It's expected that the source will be removed as part of the upgrade. During operations, equipment will be serviced and maintained to ensure that noise levels do not inadvertently increase and to avoid the introduction of potential tones or impulsive noise.

11.4 RESIDUAL IMPACT

As mitigation measures are precautionary and/or already included in the assessment, the residual impacts and effects are as described above.

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12 LANDSCAPE AND VISUAL

12.1 INTRODUCTION

This Landscape and Visual Assessment (LVIA) has been prepared to accompany a planning application for the development of grid connected energy support projects on lands with an area (redline boundary) of 43.2 hectares (ha) (104 acres) in the townlands of Coolpowra, Ballynaheskeragh, Coolnageeragh and Gortlusky, County Galway. This LVIA describes the landscape context of the proposed development and assesses the likely landscape and visual impacts of the scheme on the receiving environment.

- Landscape Impact Assessment (LIA) relates to assessing effects of a development on the landscape as a resource in its own right and is concerned with how the proposal will affect the elements that make up the landscape, the aesthetic and perceptual aspects of the landscape and its distinctive character.
- Visual Impact Assessment (VIA) relates to assessing effects of a development on specific views and on the general visual amenity experienced by people. This deals with how the surroundings of individuals or groups of people may be specifically affected by changes in the content and character of views as a result of the change or loss of existing elements of the landscape and/or introduction of new elements. Visual impacts may occur from; Visual Obstruction (blocking of a view, be it full, partial or intermittent) or; Visual Intrusion (interruption of a view without blocking).

12.2 DESCRIPTION OF RECEIVING ENVIRONMENT

The surrounding local landscape comprises relatively flat terrain intersected by small, shallow, winding river valleys. However, there is one moderately sized hillock, Church Hill, in the southern half of the study area, which peaks at 91m AOD. Otherwise, elevations begin to gradually decline in the western half of the study area, in the direction of the river valley associated with the Kilcrow River, which skirts past the study area in a north/south direction some c. 1.8km west of the site at its nearest point. In terms of land use, the principal form of land cover within the study area and wider landscape is pastoral farmland bound by mixed mature hedgerow vegetation. Small blocks of forestry are dotted throughout the study area, whilst small pockets of mature woodland are also located throughout the surrounding local landscape. Some of the most notable areas of vegetation occur along the periphery of the existing peat bogs within the study area, which are also prominent land uses within the study area and are contained to the north and east of the site. The existing Oldstreet 400kV substation is one of the more notable single land uses

within the study area and is located on lands immediately north of the proposed development.

The principal settlements in the study area are located along its periphery. Portumna is some 4.5km to the south of the site, whilst Killimor is situated some 3.5km north of the site. Aside from these two settlements, the study area comprises a modest but dispersed rural population that comprises a combination of linear clusters of residential dwellings, small cross-road settlements and isolated farmsteads. The most notable transport route within the study area is the N65, which passes through the eastern half of the study area at a distance of approximately c. 150m east of the main site entrance. All other major routes within the study area are located in its wider periphery. The nearest local road to the proposed development is the L8763 local road, which is situated immediately east and north of the site. The L8805 local road also occurs a short distance to the south of the site, whilst an unnamed local road is situated just over 200m to the west of the site.

Whilst the central study area is not highly synonymous with tourism or outdoor recreation, some aspects of the wider study area encompass some notable tourism values and assets. Due to the location of the settlement of Portumna to Lough Derg and the River Shannon, it is a popular destination for boating enthusiasts and encompasses several harbours and marinas in addition to local swimming areas.

Within the current Galway County Development Plan the proposed development is contained within the 'Eastern Plains Region' whilst the proposed development is entirely contained within the 'Central Galway Complex Landscape' landscape type. In terms of landscape units, the proposed development is contained within 'Kilcrow Basin' unit where the character is described as a "working landscape, locally elevated. Larger areas of bog and forestry. Elevated concentrations of settlements and infrastructure".

With regard to landscape sensitivity, the 'Kilcrow Basin' landscape unit are classified with a ''Low' landscape sensitivity highlighting the robust and settled nature of much of the surrounding landscape.

In terms of scenic designations, two scenic views are located on the wider periphery of the study area, but are oriented in the opposite direction to the site. Similarly, a scenic route designation occurs in the southwest periphery of the proposed development, however, there is little clear visibility in the site’s direction from sections of this scenic route within the study area.

12.3 IMPACT ASSESSMENT

12.3.1 ASSESSMENT OF RECEPTOR SENSITIVITY – LANDSCAPE

This is a typical rural landscape comprised of relatively flat to low-rolling terrain cloaked in rolling pastoral farmland and networks of mature mixed hedgerow vegetation. It is not considered that this is a particularly rare or distinctive landscape in the context of County Galway or the wider island of Ireland. One of the principal features of the local landscape context is the existing 400kV substation development. There are no notable settlements within the immediate study area, with settlement within the immediate surrounds of the site typically comprising a modest rural population of small linear clusters of residential dwellings and isolated farmsteads. There is also no strong sense of amenity or recreation within the immediate study area, and instead, much of the local landscape value relates to the subsistence of the rural economy as opposed to any highly susceptible naturalistic, scenic or tourism values. This is further reflected in the Galway County Development Plan, where the landscape character type 'Central Galway Complex Landscape' which contains the site and most of the study area, is classified with a 'Low (1)' landscape sensitivity, defined as 'unlikely to be adversely affected by change'. Furthermore, the 'Central Galway Complex Landscape' character type is divided into landscape character units. The site is located entirely within Unit '6d – Kilcrow Basin, described as a 'Working landscape, locally elevated. Larger areas of bog and forestry. Elevated concentrations of settlements and infrastructure.' Therefore, on balance of these factors, the landscape sensitivity is deemed to be **Medium-low**, with some areas of higher sensitivity in the wider surrounds of the study area that are principally associated with Lough Derg and The River Shannon in the wider eastern and southern periphery of the study area.

12.3.2 ASSESSMENT OF RECEPTOR SENSITIVITY – VISUAL

15 no. viewpoint locations were selected throughout the study area, representing a range of viewing angles, distances, and visual receptors. The majority of views were contained in the near and immediate local surroundings of the development, as this is where the most potential for significant visual effects are likely to occur. The sensitivity of visual receptors ranged from Medium to Medium-low, which reflects the robust nature of the study area. Those receptors identified with a Medium-low sensitivity represent typical rural views, whereas views identified with Medium sensitivity are typically related to slightly elevated or more open views across the rolling countryside.

12.3.3 MAGNITUDE OF LANDSCAPE EFFECTS – CONSTRUCTION STAGE

During the construction phase, there will be a far higher intensity of activity at the site than during the operational phase comprising HGV traffic along the surrounding road network. Construction stage impacts will also be generated by the introduction of temporary site lighting and the temporary storage of construction materials and excavated ground. The construction of the larger elements within the site will also require tower cranes, which will likely be visible above the intervening surrounding hedgerow networks in the near surrounds of the site. Construction phase impacts on the landscape are considered to be 'short-term' and are likely to last between 18-24 months. A summary of construction activities within the site is included below:

- HGVs transporting materials to and from the site;
- Movement of heavy earth-moving machinery and tower cranes on-site;
- Temporary storage of excavated materials and construction materials on-site;
- Gradual emergence of the proposed development, and associated works, including tower cranes;
- Security hoarding and site lighting.
- Areas of soil stripping to facilitate the proposed parking area.
- Trees and hedgerows to be retained will be protected in accordance with British Standard BS5837: 2012 'Trees in Relation to Design, Demolition and Construction

The physical construction stage works will have a significant effect on the character of the local landscape, which is primarily influenced by more typical rural land uses such as pastoral farmland. Nonetheless, there is a high degree of intervening layers of mature vegetation located in the surroundings of the site, which will notably reduce the perceived effect of the construction stage effects at receptors beyond c. 500m to 1km from the site. Furthermore, construction-related activity and its effect on landscape character will be 'short-term' in duration. For these reasons, it is considered that the proposed development will result in significant localised landscape effects during the construction stage. However, impacts will reduce rapidly beyond the immediate site context, where the site will be heavily screened by the surrounding layers of existing vegetation.

12.3.4 MAGNITUDE OF VISUAL EFFECTS – CONSTRUCTION STAGE

During construction, the main visual impacts will arise from frequent heavy vehicle movements and worker vehicles travelling to and from the site and using the site entrance. In addition, there will be construction machinery and tower cranes on site, which will rise above intervening vegetation and buildings. There will also be stockpiles of stripped topsoil

and construction materials awaiting use. However, aside from the local roads located in the immediate vicinity of the site, where there is potential for clear views of the development, a large part of this 'short-term' activity within the site will remain screened and partially screened from view the surrounding mature layers of intervening vegetation. Furthermore, construction-related activity is temporary in nature and will cease once the development becomes fully operational. Thus, construction stage impacts are likely to result in significant, short-term and highly localised visual effects. In similar circumstances to the landscape effects, these will rapidly reduce beyond the immediate site context as the site becomes screened and softened by the surrounding layers of dense vegetation.

12.3.5 MAGNITUDE OF LANDSCAPE EFFECTS – OPERATIONAL STAGE

With regard to the landscape character of the site and surrounding study area, it presents as a relatively typical pastoral landscape. Indeed, whilst a pleasant pastoral aesthetic is noted in some locally elevated localised areas, this is a working landscape that is influenced by anthropogenic built features like major routes and existing electrical infrastructure development such as the Oldstreet substation and its surrounding corridors of overhead electricity cable corridors and their associated pylon structures. Indeed, the working character of this landscape context is further reinforced in the current landscape assessment for County Galway, which classifies the majority of the landscape of the study area with a 'Low' sensitivity classification. Landscapes classified as 'Low' sensitivity within County Galway are those 'unlikely to be adversely affected by change'.

Nonetheless, there will be some permanent physical effects to the site's land cover, which are not readily reversible. These relate to the excavation of extensive parts of the site to facilitate the foundations of the buildings and all other infrastructure. Indeed, the proposed development will result in the loss of an extensive area of agricultural for a high-intensity extensive electrical infrastructure development. Some of the most notable impacts on the local landscape character will be generated from the overall scale of the built aspects of the development, some of which rise to a maximum height of 45m, in addition to the extensive nature of the proposed development, which will comprise several different pieces of infrastructure. However, whilst the scale and intensity of the development will result in a considerable change to the local landscape character, the proposed development represents the intensification of an established land use in the form of the neighbouring existing 400kV Oldstreet substation and its surrounding overhead cable corridors.

It is also worth noting that the extensive landscaping associated with the proposed development will notably offset some of the landscape impacts associated with the proposed development. The proposed landscaping measures will use native trees and

shrub planting, amenity grass and wild-flower meadows. Several mounded berms are also proposed along the western and southern perimeter of the site, which will be planted with swathes of native woodland mix to mimic the rolling forms of the low-rolling hillocks in the surrounding local landscape. Where feasible, areas of existing hedgerows will also be protected and enhanced to maintain some sense of the existing landscape structures. Native wildflower seeding and native wetland plantings will also be located throughout the site, further bolstering the site's biodiversity values. The proposed development will also utilise an array of contemporary building materials and finishes that move away from the typical industrialised presentation of other older industrial and commercial developments within the wider landscape.

On balance of the reasons outlined above, the significance of landscape effect at the site scale and in its immediate surrounding context is deemed significant. However, these effects will reduce considerably beyond 500m-1000m from the site.

12.3.6 MAGNITUDE OF VISUAL EFFECTS – OPERATIONAL STAGE

The magnitude of visual effects during operation are presented in Table 12.1.

Table 12.1 Magnitude of Visual Effects – Operational Stage

VP NO.	VP SENSITIVITY	VISUAL IMPACT MAGNITUDE (PRE MITIGATION)	VISUAL IMPACT MAGNITUDE (PRE MITIGATION)	PRE MITIGATION SIGNIFICANCE / QUALITY / DURATION OF IMPACT	POST MITIGATION SIGNIFICANCE / QUALITY / DURATION OF IMPACT
VP1	Medium-low	Low-negligible	Low-negligible	Slight-imperceptible / Negative / Medium-term	Slight-imperceptible / Negative / Permanent
VP2	Medium-low	Low-negligible	Low-negligible	Slight-imperceptible / Negative / Medium-term	Slight-imperceptible / Negative / Permanent
VP3	Medium	Medium	Medium	Moderate / Negative / Medium-term	Moderate / Negative / Permanent
VP4	Medium-low	Medium	Medium	Moderate / Negative / Medium-term	Moderate / Negative / Permanent
VP5	Medium	Very High	High	Substantial / Negative / Medium-term	Substantial-moderate / Negative / Permanent
VP6	Medium-low	Low	Low	Slight / Negative / Medium-term	Slight / Negative / Permanent
VP7	Medium	Medium-low.	Medium-low	Moderate-slight / Negative / Medium-term	Moderate-slight / Negative / Permanent
VP8	Medium-low	High	High	Substantial-moderate /	Substantial-moderate /

VP NO.	VP SENSITIVITY	VISUAL IMPACT MAGNITUDE (PRE MITIGATION)	VISUAL IMPACT MAGNITUDE (PRE MITIGATION)	PRE MITIGATION SIGNIFICANCE / QUALITY / DURATION OF IMPACT	POST MITIGATION SIGNIFICANCE / QUALITY / DURATION OF IMPACT
				Negative / Medium-term	Negative / Permanent
VP9	Medium-low	Negligible	Negligible	Imperceptible / Neutral / Medium-term	Imperceptible / Neutral / Permanent
VP10	Medium-low	Medium Medium	Medium	Moderate/ Negative / Medium-term	Moderate / Negative / Permanent
VP11	Medium	Low-negligible	Low-negligible	Slight-imperceptible / Negative / Medium-term	Slight-imperceptible / Negative / Permanent
VP12	Medium-low	High-Medium.	High-medium	Substantial-moderate / Negative / Medium-term	Substantial-moderate / Negative / Permanent
VP13	Medium-low	Negligible	Negligible	Imperceptible / Neutral / Medium-term	Imperceptible / Neutral / Permanent
VP14	Medium-low	Low.	Low	Slight / Negative / Medium-term	Slight / Negative / Permanent
VP15	Medium	Negligible	Negligible	Imperceptible / Neutral / Medium-term	Imperceptible / Neutral / Permanent

12.4 MITIGATION AND RESTORATION MEASURES

The main mitigation by avoidance measure employed in this instance is the siting of the proposed development in a robust landscape context classified with a 'low' landscape sensitivity in the current Galway County Development Plan. The proposed development is also well offset from some of its nearest surrounding visual receptors and avails of a notable degree of screening in the form of surrounding rolling terrain and dense layers of intervening hedgerow vegetation. In addition to retaining the existing hedgerows within around the site, it is also proposed to bolster existing perimeter and internal hedgerows with under-planting and inter-planting of whip transplants in order to ensure dense and consistent screening of the site in perpetuity. This will be undertaken where required to thicken and fill gaps in the existing hedgerow network prior to the construction phase, thus allowing for any growth in the period between a grant of planning permission and construction of the development. Advanced nursery stock in the form of 8-10cm girth trees will be used to fill any noticeable gaps and plant species will be selected to complement the existing broadleaf hedgerow species mix around the site and will be of local provenance. Where not already exceeded by existing vegetation, it is intended to manage hedgerows up to 3-4m in height. This height will be achieved by a combination of allowing lower sections of existing hedgerows to mature, filling obvious gaps with advanced nursery

stock and providing an additional line of whip planting to selected hedgerows that require densification. Refer to the Landscape Mitigation Plan LD.CLPWRA for details.

It is also proposed to plant new hedgerows, with whips and a high proportion of advance nursery stock trees (c.3m planted height), within the site and along the proposed new site access tracks to further assimilate the development into the surrounding landscape context whilst also bolstering the site biodiversity values. The combination of existing enhanced hedgerows and proposed new native hedgerows will also aid in visually screened some of the lower built elements of the development from surrounding local receptors. All of this planting will be allowed to mature up to a maintained height of 3-4m to aid in the screening and softening of the proposed development from nearby dwellings and surrounding local and regional roads.

Sweeps of native woodland planting are also proposed along the earthen rolling berms that will rise to a max height of 5m along the western, southern and eastern boundaries of the site. This native thicket/woodland mix will be provided in the form of high canopy (dominants) species, low canopy (sub-dominant) species, understory and fringe (higher shrubs) species and understory and edge (lower shrub) species, and will comprise of a mix of advanced nursery stock and whip planting of local provenance. The proposed planting combined with the proposed earthen berms will be allowed to grow out to reach maturity and will heavily screen and soften the proposed development from surrounding local receptors. Indeed, it will anchor the proposed development to this landscape context and will enhance the ecological corridors within the central and wider study area.

The proposed development will also utilise an array of contemporary building materials and finishes that move away from the typical industrialised presentation of other older industrial developments. The array of proposed cladding textures will be finished in varied muted tones of green/grey, whilst the proposed energy centre building incorporates curved forms to mimic the low rolling nature of the surrounding landscape. Furthermore, the proposed energy centre stacks will be finished in a much lighter tone than the main building as they are predominately viewed against the sky and will present against it with a low degree of visual contrast. The variations in tone and texture, in addition to the variation in the built form of the proposed development, will all help diminish its perceived height and massing. When feasible, ancillary structures and buildings will be finished in a green tone or muted shades to help blend them in with the surrounding pastoral landscape context.

12.5 RESIDUAL IMPACTS OF THE DEVELOPMENT

In terms of Landscape Impacts, the proposed development will have a direct physical impact on the site's land cover and will somewhat impose itself on the existing landscape structure of the site, with the removal of areas of hedgerow vegetation. Whilst existing energy infrastructure notably contributes to the local landscape character, the proposed development, in terms of its scale and intensity, will have a considerable impact on the character of the landscape, predominately at the site scale and in its immediate surroundings. Notwithstanding the above, the proposed development is considered an appropriate site development and is located within a robust 'low' sensitivity landscape in the current Galway County Development Plan, which is associated with landscape areas that are 'unlikely to be adversely affected by change'.

Overall, due to the sizable scale and intensity of the proposed development, the operational phase significance of residual effect is deemed Substantial, which is considered 'significant' in EIA terms. Nevertheless, it is important to note that these effects are heavily localised to the site and its immediate surrounding landscape. Indeed, the significance of landscape effects reduces considerably to below significant beyond 200m from the site as the surrounding existing and proposed screening will heavily dimmish its perceived effect on the character of the surrounding landscape. As per the Notes and Clarifications on aspects of the 3rd Edition Guidelines on Landscape and Visual Impact Assessment (GLVIA3), it states, *"It should be noted that judgements of significance are not judgements of acceptability considering the policy context, which is a matter for decision-makers. For example, it may be the case that the LVIA concludes that a proposal would result in 'significant' adverse effects on a receptor but the proposal could still be consistent with policy"*. In this instance, it is considered that the proposed development is suitably sited in this landscape context and is not contrary to landscape and visual-related policies in the current Galway County Development Plan.

In terms of Visual Impacts, the proposed development was assessed at 15 no. viewpoint locations throughout the study area, representing a range of viewing angles, distances, and visual receptors. The majority of views were contained in the near and immediate local surroundings of the development, as this is where the most potential for significant visual effects are likely to occur. The sensitivity of visual receptors ranged from Medium to Medium-low, which reflects the robust nature of the study area. Those receptors identified with a Medium-low sensitivity represent typical rural views, whereas views identified with Medium sensitivity are typically related to slightly elevated or more open views across the rolling countryside.

The most notable residual effects will occur along the local road that traverses the rolling lands immediately east and north of the site. Indeed, whilst visibility from this local road is heavily contained in some areas, it also affords open, near-distant views of the proposed development. Viewpoint VP5 affords one of the clearest and nearest views of the proposed development, where a considerable extent of the site will be visible in the pre-mitigation scenario. It is important to note that this view does not represent any local residential dwelling but represents local community receptors travelling along this local road context. Due to the extensive scale and intensity of the development, which represents a marked degree of visual change in comparison to the baseline scenario, the significance of effect was deemed Substantial, which is considered 'significant' in EIA terms.

Nevertheless, once the proposed mitigation screen planting has full established, the intensity and perceived scale of the development will notably reduce. Thus, the residual significance of visual effect will reduce to 'Substantial-moderate' (below EIA significant effect threshold) once the proposed mitigation has fully established. The residual significance of effect at viewpoint VP8 was also deemed 'Substantial-moderate' due to its near distance to the proposed energy centre. Nonetheless, the perceived scale and extent of the development are heavily diminished from this landscape context as the entire eastern extent of the development will be entirely screened. The residual significance of effect ranged between Moderate to Imperceptible at all other representative viewpoints within the study area. Indeed, what is most notable is that effects will reduce considerably beyond 500-1000m from the site, and in many instances, receptors in the wider surrounds of the study area will have very little clear visibility of the proposed development.

12.6 CUMULATIVE IMPACT ASSESSMENT

In terms of the cumulative impacts of the proposed development, much of the assessment of this is already contained within the landscape and visual impact appraisal above and relates to the proposed developments cumulative landscape and visual effect with the existing Oldstreet 400kV substation development located immediately north of the site and the overhead cables and pylon structures located in the immediate surrounding landscape, both of which have been assessed as part of the baseline context of this landscape setting. Thus, it is considered that the cumulative landscape and visual effect of the development is deemed Low.

12.7 SUMMARY OF SIGNIFICANT EFFECTS

Based on the landscape and visual impact judgements provided throughout this LVIA, the proposed Coolpowra development will give rise to some heavily localised landscape effects at the site scale and in the immediate surrounding landscape. The residual significance of

visual effect ranged between 'Substantial-moderate' to 'Imperceptible', with the significance of visual effect reducing considerably beyond the immediate context of the site. In the context of the proposed development and the receiving 'low' sensitivity landscape classification (Galway CDP), it is not considered that the proposed development represents an inappropriate addition to this landscape context and complies with landscape and visual-related policies and objectives in the current Galway County Development Plan.

13 TRAFFIC AND TRANSPORT

13.1 INTRODUCTION

The traffic and transport impacts of the Coolpowra Flex Gen project (in the townlands of Coolpowra, Cooldorragha, Coolnageeragh, Ballynaheskeragh, Gortlusky and Sheeaunrush, County Galway) including three separate elements: a Reserve Gas-Fired Generator (hereafter Generator) (Project 1); a grid-connected Energy Storage System (ESS) facility (Project 2); and, a Gas Insulated Switchgear (GIS) Electricity Substation (Project 3), have been assessed individually, and in combination by Traffic Transport and Road Safety Associates Ltd. (TTRSA).

The proposed development site is to be accessed via an upgraded site access junction off the L8763 local road, which in turn is accessed from the N65 national road approximately 5km to the north of Portumna and 25km to the south-east of Loughrea.

The assessment has followed current legislations and guidance including: the TTA guidelines produced by Transport Infrastructure Ireland (TII); and, the Environmental Protection Agency (EPA) Guidelines on the information to be contained in Environmental Impact Assessment Reports, and involved a range of desktop study and field work, including: traffic data collection; and, traffic modelling.

13.2 ASSESSMENT OF EFFECTS

The traffic modelling output for the construction phases of all three projects, in isolation and combination, shows that the proposed will not have a material impact on the operation of the L8763/Site access junction or the N65/L8763/L8760 junction, and that both junctions will operate with a large amount of spare capacity and minimal queuing.

No significant visual defects were observed within the immediate vicinity of the N65/L8763/L8760 junction during a site visit on 29th May 2024. The level of traffic anticipated to be generated by the Coolpowra Flex Gen project would not be anticipated to result in a measurable impact on the road structure of the N65. The pavement formation on the L8763 is unknown, and as such construction traffic may result in short term localised degradation to the L8763 carriageway and bordering frontage strips.

A Stage 1 Road Safety Audit has been undertaken on the highway related works on the L8763, including the Coolpowra Flex Gen project site access and alterations to the N65/L8763/L8760 junction. Following implementation of the recommendations of the Stage 1 Road Safety Audit and following subsequent completion of Stage 2 and Stage 3

Road Safety Audits, the impact of the proposed development on road safety is predicted to be not significant.

13.2.1 CONSTRUCTION

Whilst some traffic noise is anticipated in the immediate vicinity of the site, for example associated with AM peak hour arrivals and PM peak hour departures of construction operatives for the three projects in isolation and combination, the level of trip generation means that this increase in noise is unlikely to be significant based on normal significance criteria for traffic noise.

Due to the relatively low traffic volumes generated by the three projects in isolation and combination during the construction phase, and the dispersed nature of access over the road network, no measurable impact is anticipated in relation to atmospheric pollutants from traffic related to the project.

13.2.2 OPERATION

As there will be minimal traffic movements associated with the 15-20 operatives (employed over three shifts) related to the operation of the Generator project, assuming that the access road and access junction are maintained, there will be no measurable traffic related environmental impacts during the operational phase of the project.

13.3 MITIGATION

The mitigation measures proposed are common between the individual projects and for the proposed development. Specifically: implementation of the recommendations contained with the Stage 1 Road Safety Audit; and, making good any localised degradation to the L8763 carriageway as a result of construction traffic.

13.4 SUMMARY OF EFFECTS

Based on the assessment and implementation of the recommended mitigation measures, no significant environmental effects are predicted as a result of the traffic and transport associated with the proposed development.

14 ARCHAEOLOGICAL AND CULTURAL HERITAGE

An archaeological and cultural heritage assessment was undertaken in relation to the site of a proposed development located in the townlands of Coolpowra, Ballynaheskeragh, Coolnageeragh and Gortlusky, with minor elements in the townlands of Sheeaunrush and Cooldorragha, situated west of the N65 road between Portumna and Killimor in County Galway (ITM 582444, 708888). This assessment was carried out to identify, describe and present an assessment of the likely significant effects of the proposed development on archaeological and cultural heritage remains (known and unknown if present) and to outline mitigation measures to offset such potential effects.

The development consists of three main elements: (1) OCGT, (2) GAS, (3) SYNCON + LDES, as well as all associated services/groundworks. The indicative route for a related gas pipeline commencing at New Inn has also been designed to avoid any known archaeological and architectural heritage constraints. This Gas Networks Ireland (GNI) project will be established through a separate planning application and associated impact assessment.

The site contains no Recorded Monuments as listed within the *Record of Monuments and Places* (RMP) and the *Sites and Monuments Record* (SMR). There are also no architectural heritage sites (NIAH) or Protected Structures (RPS), as listed in Appendix 6 of the *Galway County Development Plan 2022–2028*, within the site.

A site inspection was conducted in February 2024. This confirmed the site consists of undulating terrain of mixed-use pasture and tillage cultivation. A series of drumlins were noted, with the lower lying areas subject to waterlogging. The field system boundaries were recorded as predominantly maintained hedgerows with occasional mature trees. No previously unknown archaeological or cultural heritage features were identified.

To inform the EIAR and planning process, a non-invasive geophysical survey was also carried out across the greenfield elements of the site, within the townlands of Ballynaheskeragh, Coolpowra, Coolnageeragh and Gortlusky. This comprised a full detailed gradiometer survey using a Bartington GRAD 601-2 dual-sensor fluxgate gradiometer cart system (24R0048; Murphy 2024). No definite signs of archaeology were identified during the survey, however, anomalies of archaeological potential were recorded and these will require further assessment. For example, potential spreads/pits (M2a–d, M4, M7) and curvilinear features (M1, M3, M5, M6) were recorded in Fields 3, 4–5, 7, 11, 16, 18 and 19. Some of which could represent early field systems, ploughed out enclosures or the remains of structures, pits , posts/post-holes, kilns or deposits. In addition, numerous linear anomalies corresponding with former field boundaries depicted on the examined

Ordnance Survey mapping of 1837 and 1892 were also detected in Fields 1, 3–7, 10, 12–14, 18 and 19. Linear anomalies that are not recorded field boundaries were also detected in Fields 1, 6, 11, 16 and 18 and likely represent early field system drains or paths/access tracks. Anomalies marked as 'Cultivation' across the site represent furrows/plough marks or possible land drains.

An upstanding farmhouse and outbuildings are located within the site, in the townland of Gortlusky, and are scheduled for demolition. These buildings are located on the site of a cluster of three buildings depicted on the 6-inch map of 1837, with the middle structure extended into a larger farmhouse by the time of the 25-inch map of 1892. Accordingly, some aspects of the original vernacular structures may remain upstanding and will require further assessment.

Additional cultural heritage features depicted on the examined Ordnance Survey mapping of 1837 and 1892 were also noted but have no above ground remains surviving. A potential direct effect on these features lies in the uncovering of sub-surface remains during groundworks. These include two structures in the townland of Ballynaheskeragh that are depicted on the 1837 map with an associated enclosed yard and limekiln. The yard and limekiln are gone by the time of the 1892 map, while the structures are demolished sometime before the Cassini map of 1956. Additional potential features depicted on the historic mapping include wells in the townlands of Gortlusky and Ballynaheskeragh.

Townland boundaries also extend through the proposed development lands, with that along a roughly east–west axis separating Coolpowra, Gortlusky and Cooldorragha from Ballynaheskeragh, while a roughly north–south boundary through the west end of the site separates Coolpowra and Gortlusky. These land divisions represent the smallest administrative divisions in Ireland and many have a deep history that goes beyond their subsequent standardisation in the seventeenth century. Accordingly, where any of the townland boundaries are to be impacted by the development they will require further assessment.

The predicted effects, direct or indirect, on known archaeological heritage and recorded architectural heritage in relation to the proposed development are regarded as being none as no such monuments/sites (RMP/SMR/NIAH/RPS) are located within the proposed development area.

A potential effect on the archaeological and cultural heritage resource lies in the uncovering of sub-surface archaeological remains during groundworks associated with the proposed development. This includes anomalies of archaeological potential identified by the geophysical survey, as well as any upstanding and subsurface remains of vernacular

architecture, associated features such as limekilns and wells, and townland boundaries. Should such archaeological and cultural heritage features be present, the proposed development will have a negative, permanent and profound effect on such remains.

The following mitigation measures will be carried out subject to the approval of the National Monuments Service (NMS) of the Department of Housing, Local Government and Heritage (DHLGH) and further mitigation may be sought by the NMS.

- A visual assessment, including a photographic survey, of the upstanding farmhouse and associated outbuildings prior to demolition. This should be completed by an archaeologist with built-heritage experience.
- A written record and photographic survey of any townland boundaries to be impacted.
- Archaeological test trenching (minimum of 10% of the lands available) will be carried out prior to any groundworks commencing and will be undertaken by an experienced, licence-eligible archaeologist working under licence from the DHLGH. The trenches will be positioned to test the site (within the footprint of the proposed development) generally and to target the following:
    - Anomalies identified during the geophysical survey.
    - The area of the upstanding farmhouse and associated outbuildings following demolition.
    - Location of features (vernacular buildings, limekilns, wells) identified on historic mapping.
    - Any townland boundaries to be impacted to record a measured survey.

  If archaeological and cultural heritage features or deposits are exposed these shall be sufficiently sectioned in order to assess their extent, nature and significance. Once test trenching is complete, further mitigation might include preservation *in situ* (avoidance), excavation (preservation by record) and/or monitoring of topsoil stripping.
- Adequate time and resources will be provided by the developer for the resolution of any archaeology identified within the development site and which will be directly impacted by groundworks. Time and resources will also be allowed for any post-excavation work and specialist analysis necessary following any archaeological excavation that takes place.
- A report is required to be compiled on completion of any archaeological excavation and will be submitted to the relevant authorities.

If these mitigation measures are implemented, the residual impacts are likely to be neutral and none to imperceptible.

15 CLIMATE

The proposed development for which planning permissions are sought includes a Reserve Gas-fired Generator, a Energy Storage System (ESS) and a 400kV GIS Electricity Substation. The impact assessment methodology is based on the Institute for Environmental Assessment and Management (IEMA) Guidance (2017, 2020, 2022) on the assessment of Greenhouse Gas Emissions and Climate Impacts.

This assessment report provides a Greenhouse Gas (GHG) impact assessment and Climate Change Resilience Assessment which are key elements of the IEMA Guidance on the assessment of GHG emissions and Climate Impacts. The key features of these assessments are summarised as follows:

- The Lifecycle GHG Assessment considers impacts on the climate from GHGs arising from the Proposed Development, including how the Proposed Development would affect the ability of the Irish government to meet its carbon reduction plan targets.
- The Climate Change Resilience Assessment considers the resilience of the Proposed Development to climate change.

The Greenhous Gas (GHG) emissions during the construction phase have been estimated at 28.2 tCO_{2E} per year. When these emissions are compared to the Irish carbon budgets, the construction phase emissions contribute significantly less than 1% of the annual carbon budget during the projected construction period.

The proposed Reserve Power plant is projected to have a lifespan of 25 years, although future developments and adaptations could conceivably lead to an extension in lifespan. At the end of the design life, the proposed Reserve Power Plant would either be decommissioned or the lifespan would be extended. For the purpose of the current assessment, a 25-year lifespan is assumed. An estimate of GHG emissions during the lifespan of the proposed plant has been calculated at 616,410 tCO_{2E} per year.

When considered in isolation as a standalone Reserve Power Plant, the proposed development would have a major adverse impact on climate. However, the Proposed Development would provide additional peak power generation capacity, which would contribute to providing a secure energy supply to the national grid. A key element of the national decarbonisation strategy is to target 70% renewable electricity by 2030. To allow this uptake of renewable energy to happen it is necessary to have in place sources of energy generation that can be efficiently utilised to cover any imbalances in supply and demand. Natural gas is a relatively lower-carbon option than coal or peat to provide

security of supply, so when viewed in comparison with existing fossil-fuel plants, the proposed development would have a positive impact on climate. Energy security is of national importance and the proposed development has a significant role to play in the national strategy and in the achievement of security of supply. No significant Climate Change Resilience Impacts were identified.

16 CUMULATIVE EFFECTS & INTERACTIONS

This Chapter of the EIAR describes provides an assessment of the potential for cumulative and combined effects to occur as a result of the Proposed Development. The Chapter describes the main interactions between potential impacts identified as part of the Environmental Impact Assessments of the proposed development and for each of the proposed projects in the townlands of Coolpowra, Cooldorragha, Coolnageeragh, Ballynaheskeragh, Gortlusky and Sheeaunrush, County Galway.

The development of the individual and collective projects have the potential to impact on various environmental aspects, and there are interactions and inter-relationships between these aspects, as presented below. This EIAR has considered these interactions and inter-relationships throughout the design process through appropriate siting of development components, functional design in accordance with the relevant standards /codes and guidelines and incorporation of mitigation measures as recommended by the EIA team of specialists.

The interaction of environmental factors was identified and carefully considered from the outset of the project. Interactions during construction, operational and decommissioning stages of the proposed development are considered.

Table 16.1 presents a matrix of interactions likely to occur from the proposed development (highlighted in green). The level of interaction between the various media will vary greatly but the table allows the interactions to be identified and detailed where necessary. If the development does not have the potential to impact or affect the interaction, then that interaction is not highlighted in green.

Table 16.1 Interactions between Environmental Factors

	Population & Human Health	Air & Climate	Noise & Vibration	Landscape & Visual	Biodiversity	Waters	Soils and Geology	Material Assets	Traffic & Transport	Archaeology & Cultural Heritage
Population & Human Health		C/D, O	C/D, O	C/D, O			C/D		C/D,	
Air & Climate	C/D, O				C/D, O		C/D		C/D	
Noise & Vibration	C/D, O				C/D				C/D	
Landscape & Visual	C/D, O									
Biodiversity		C/D, O	C/D			C/D, O	C/D			
Waters					C/D, O		C/D, O			
Soils and Geology	C/D	C/D			C/D	C/D				
Material Assets										
Traffic & Transport	C/D	C/D	C/D							
Archaeology & Cultural Heritage										

C/D= Construction /Decommissioning
O = Operation

Table 16.2 Summary of Interactions

Interaction of Environmental Factors	Description
Air Quality, Population, Human Health and Biodiversity	There is potential for impact to human beings living in the area of the proposed development during the construction, operation and decommissioning phases of the development. These have been outlined and assessed in the EIAR. The impact of construction activities on air quality during the construction phase of all projects is short term in duration and its significance will vary from not significant to slight. The air quality impact at the nearest residential receivers is associated with each of the projects (and in combination) is predicted to be below the relevant air quality standard limit values and is therefore determined to be negligible. Similarly, the impact on identified protected ecological site and biodiversity is not significant.
Noise, Human Beings and Biodiversity	The impact of noise on the human beings living in the area of the proposed development has been addressed during the construction, operational and decommissioning phases of the proposed development. Appropriate mitigation measures have been recommended to ensure the construction phase target noise limits are not exceeded. These will be further prescribed in a construction management plan subject to planning. The predicted noise levels at the nearest neighbouring residential properties due to the operation of the proposed projects during daytime and night-time will be in accordance with lower limits for areas of low background noise. Given the proximity of the development lands and projects to designated ecological sites, noise impacts on the local ecological receivers is not considered significant.
Landscape and Visual, Biodiversity, Population and Human Health	The landscape and visual impacts have potential interactions with impacts resulting from other environmental statement topics. The interactions of these impacts are usually highly complex in practice and this section serves to act as a brief overview to these issues. In addition, the proposed development will create varying impacts during the construction phase and the operation phase. No designated scenic views will be affected by the proposed

Interaction of Environmental Factors	Description
	development. The proposed mitigation planting (including a new berm) will increase the variety of native tree and shrub species on site and this will have a positive impact of providing increasing screening and increased ecological benefit. The management of the site vegetation will also result in a positive impact to the appearance and condition of site vegetation. The residual significance of visual effect ranged between *'Substantial-moderate'* to *'Imperceptible'*, with the significance of visual effect reducing considerably beyond the immediate context of the site. In the context of the proposed development and the receiving 'low' sensitivity landscape classification (Galway CDP), it is not considered that the proposed development represents an inappropriate addition to this landscape context and complies with landscape and visual-related policies and objectives in the current Galway County Development Plan
Soils & Geology and Water Environment	There is an interaction between soils & geology and the water environment. The disturbance of soil during construction has the potential to impact on water quality. Construction activities which disturb or expose the soil, including realignment of the stream, have the potential to elevate suspended solids in runoff from the site which could impact on local drains. Mitigation measures during the construction process will prevent sediment run-off and construction discharges. A preliminary CEMP has been prepared and shall be further development and implemented for the construction phase. This provides a framework under which construction activities which have potential for environmental impact (e.g. generation of dust, ecological impacts, surface water discharge, etc) will be managed. Mitigation measures as outlined in the EIAR are included within this plan. There will be no direct process to soils or surface water bodies during the operational phase of the developments (in isolation or in combination). Stormwater generated on the site will be managed in accordance with sustainable best practice proposals as presented in

Interaction of Environmental Factors	Description
	the drainage report for each project. Overall, the impact is not considered significant.
Traffic & Transport, population and human health, noise & vibration, and biodiversity	There will be potential interactions with increased traffic movements as a result of the construction and to a lesser extent the operation of the proposed projects with potential effects on population and human health, air quality, noise and vibration and biodiversity. This is dealt within each Chapter of the EIAR The impact of construction stage traffic on air quality, human health, noise & vibration and biodiversity is short term to not significant (depending on activities) and long term imperceptible during operation.

The proposed development of the individual and collectively development has the potential to impact on various environmental aspects, and there are interactions and inter-relationships between these aspects, as presented in Table 16.1 and described in Table 16.2. This EIAR has considered these interactions and inter-relationships throughout the design process through appropriate siting of development components, functional design in accordance with the relevant standards /codes and guidelines and incorporation of mitigation measures as recommended by the EIA team of specialists.

FIGURES

SITE LOCATION MAP

Figure A.1 Site Location (1:50,000)

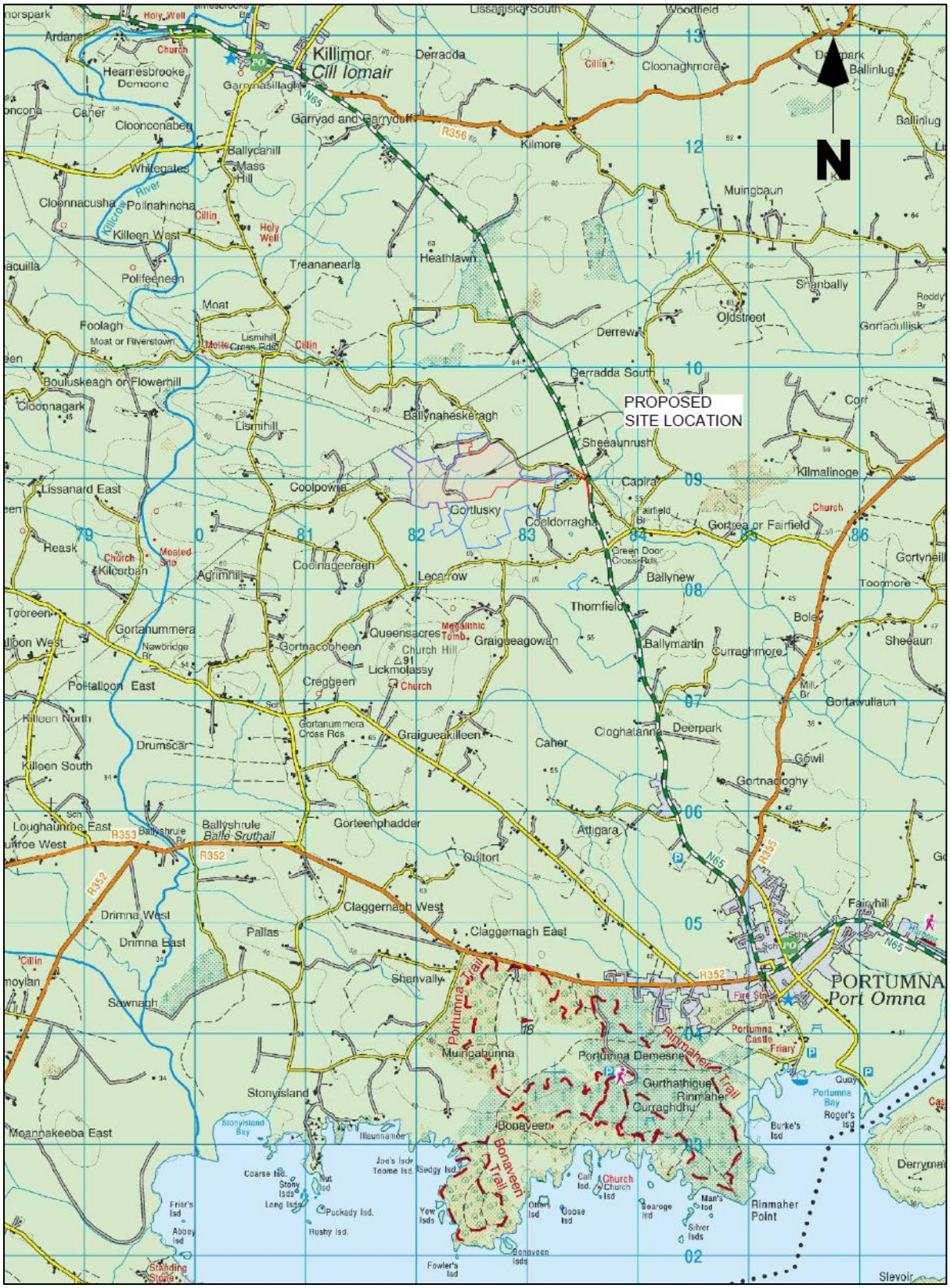

Figure A.2 Site Location Map (1:2,500)

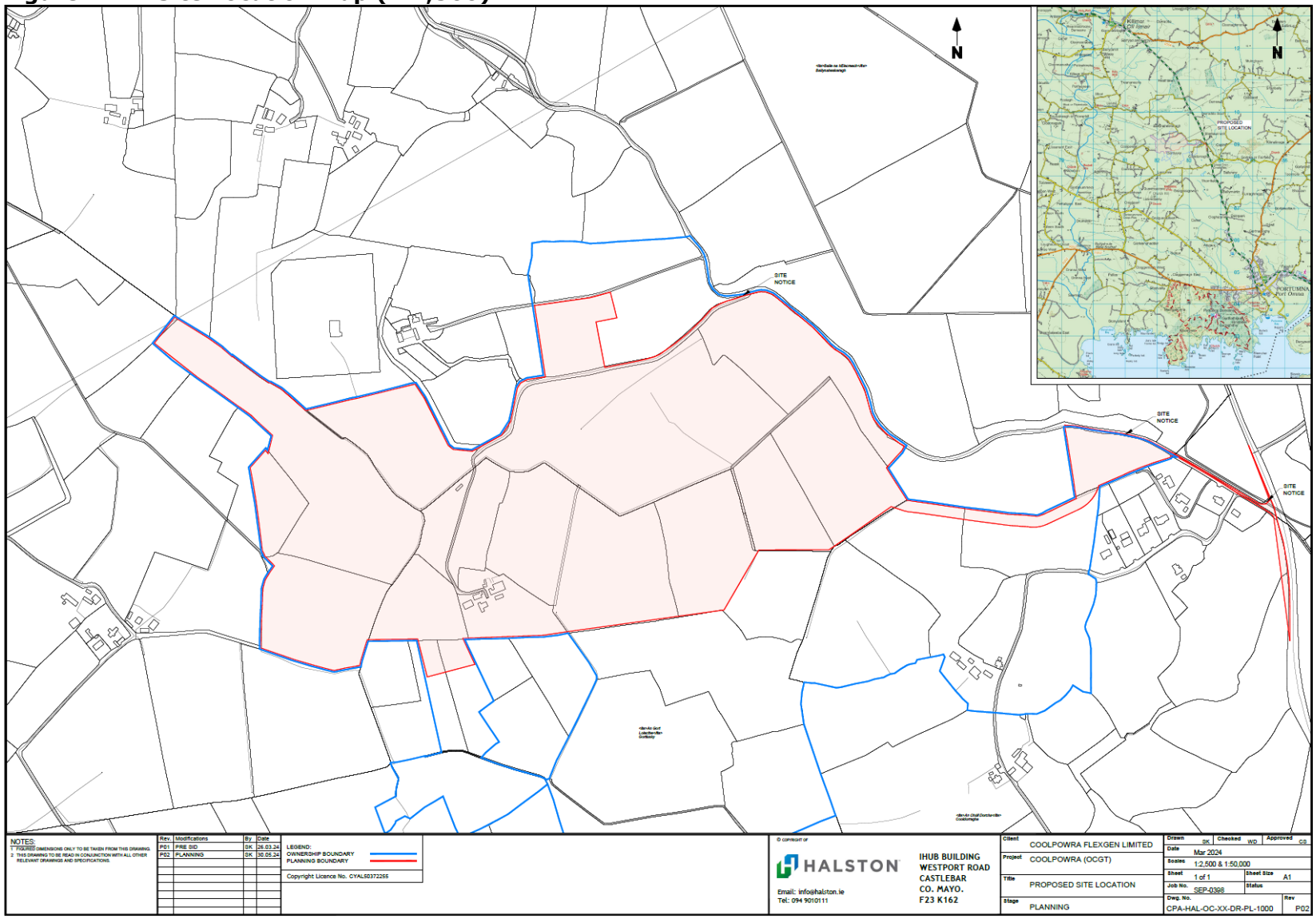

FIGURE A.3

PROPOSED LAYOUTS WITHIN DEVELOPMENT LANDS

Figure A.3 Proposed Layout (Halston Drawing Ref CPA-HAL-MP-XX-DR-PL-1000)

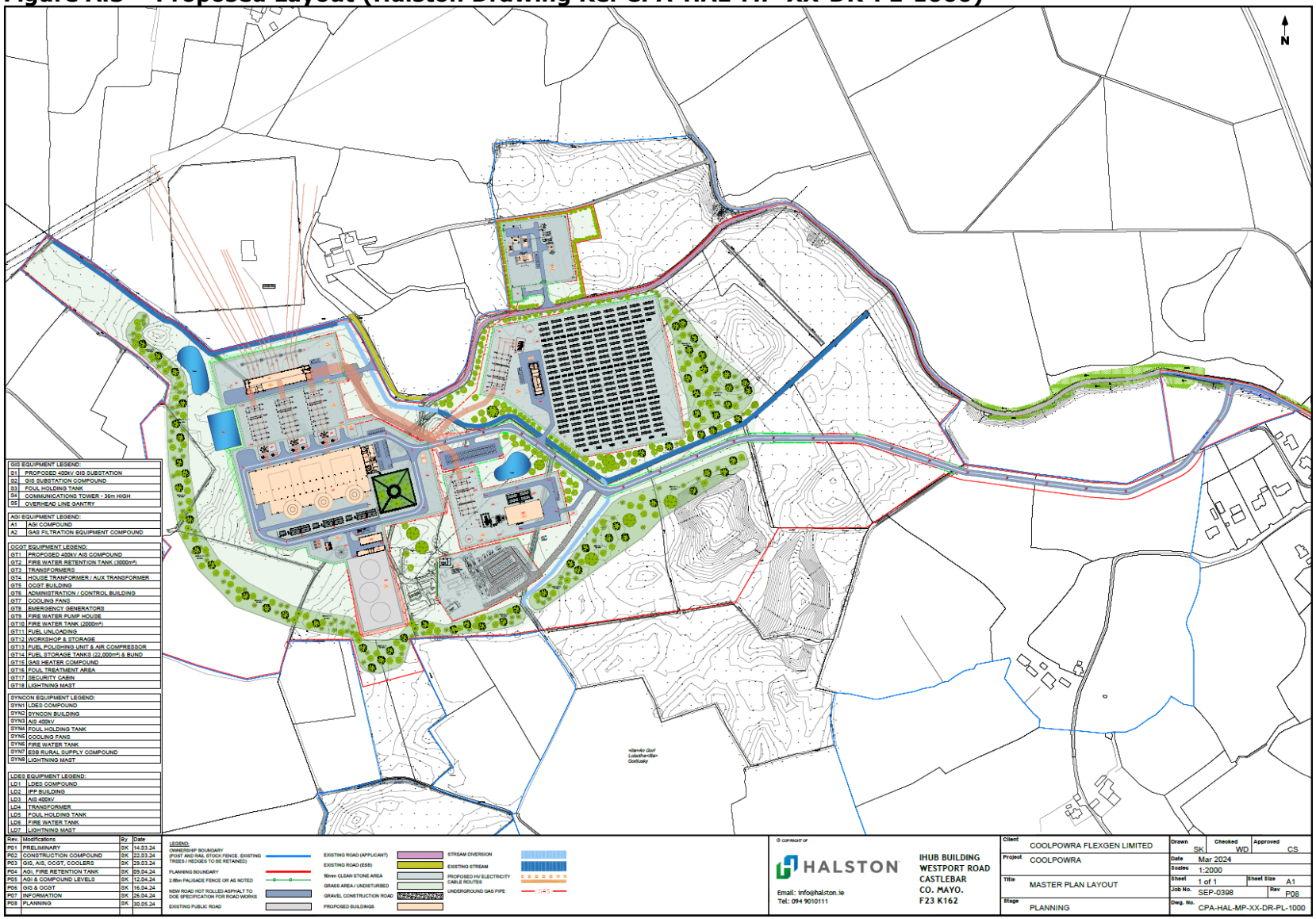

Figure A.4 Masterplan Layout with Landscape and Biodiversity Mitigation Plan