FEHILY TIMONEY

DESIGNING AND DELIVERING
A SUSTAINABLE FUTURE

BALLYNAHONE LONG DURATION ENERGY STORAGE

Planning and Environmental Report

Prepared for:

FuturEnergy Ireland Development DAC

FuturEnergy Ireland

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PLANNING AND ENVIRONMENTAL REPORT

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Abstract: This Planning and Environmental Report considers planning and environmental issues concerning the development of a long duration battery energy storage facility adjacent to an existing 110kV network substation within the townland of Ballynahone, near Buncrana, Co. Donegal. The report describes the key characteristics of the proposed project, potential environmental impacts and mitigation measures, planning policy considerations, stakeholder engagement and consultation. A copy of this report is included as part of the planning application submission for the proposed Project.

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1. INTRODUCTION

1.1 Project Background

FuturEnergy Ireland Development DAC (the Applicant) intends to develop a Long Duration Energy Storage (LDES) Facility in the townland of Ballynahone, Co. Donegal. Fehily Timoney and Company (FT) have been appointed by the Applicant to prepare a planning application for the proposed Project.

The purpose of the LDES Facility will be to provide long duration energy storage to support the penetration of renewable energy generation onto the national grid. The Project includes an 'under the fence' (UTF) transformer compound adjacent to the existing Trillick 110 kV network sub-station. The transformer compound (hereunder referred to as the 'UTF Transformer Compound') is required to enable the connection of the LDES Facility to the national grid. Please refer to Chapter 2 of this Report for a detailed description of the proposed development.

This planning application is for permission for the proposed LDES Facility from Donegal County Council under section 34 of the Planning and Development Act 2000 (as amended) (PDA).

This Planning and Environmental Report sets out the key characteristics of the proposed development outlining the construction, operational and decommissioning stages of the proposed LDES Facility and associated grid connection before describing the potential impact of the proposed development and mitigation measures where necessary.

1.2 Statement of Authority

Fehily Timoney and Company (FT) is an Irish engineering, environmental science and planning consultancy with offices in Cork, Dublin and Carlow. The practice was established in 1990 and currently has c.100 members of staff, including engineers, scientists, planners and technical support staff. We deliver projects in Ireland and internationally in our core competency areas of Waste Management, Environment and Energy, Civils Infrastructure, Planning and GIS and Data Management. In April 2019, FT invested in its geotechnical services to significantly increase the size of its geotechnical team through the acquisition of the AGEC Geotechnical Consultancy team.

Table 1.1 below details the Statements of Authority of the Authors of the technical chapters contained within this document.

Table 1-1: Statement of Authority for Authors of the Technical Chapters and Reports included in this Planning Application

Chapter	Contributor	Additional Details
5 – EIA Screening	Conor Auld	Conor holds a MSc in Urban and Rural Design (Commendation) and BSc in Environmental Planning (2.1), both from Queen's University Belfast. He also holds an Advanced Diploma in Planning and Environmental Law from the Honorable Society of Kings Inns.

Chapter	Contributor	Additional Details
	Jim Hughes	Conor is a Senior Planner with in excess of 7 years of professional experience in private and public sector roles in Ireland and the United Kingdom; over 6 years having been spent working in private sector planning in Ireland. Conor has completed numerous EIA Screenings for renewable projects in Ireland. Jim Hughes is the Director responsible for the Energy and Planning Department. Jim has a BA in Public Administration (Development) from the University of Limerick, a Masters in Town Planning from Queens University Belfast and a Diploma in EIA/SEA Management from University College Dublin. Jim is also a member of the Irish Planning Institute. Jim is a Qualified Town and Environmental Planner with over 19 years post qualification planning experience in both the private and public sector. He has extensive experience in providing strategic level advice to clients and negotiating with and presenting to local authorities. Jim has experience in the management and coordination and the preparation of planning applications, masterplans and Environmental Impact Statements for large scale infrastructure projects throughout Ireland. He has specific experience in the renewable energy sector. Jim has represented clients on planning enforcement matters and as expert witness at oral hearings. He is also experienced in peer review and preparation of independent planning assessments and appraisals on behalf of clients.
6 - Land, Soils, Geology And Hydrogeology	Emily Archer	Emily is a Geotechnical Engineer with over 5 years geotechnical consultancy experience in Ireland. Emily has completed numerous geotechnical & geological impact assessments for wind farm developments in Ireland.
7 - Hydrology, Water Quality And Drainage	Brian Cronin	Brian is a Senior Environmental Scientist with Fehily Timoney and Company. He has eight years of post-graduate experience in technical positions with five years specifically in environmental roles.
8 – Biodiversity, EcIA and AA Screening	Eimear Stephenson	Éimear is a Project Ecologist with 3 years' experience in the environment sector. She has experience producing a multitude of reports, including Appropriate Assessment and Environmental Impact Assessment reports. She has also undertaken a number of field surveys, including habitat, mammal, bat, and otter surveys, and has held licenses under the Wildlife Act to survey freshwater pearl mussel and white clawed crayfish. Éimear graduated with a 1:1, and was first in her class during her BSc in Marine Science degree. She also received a scholarship to attend the University of Dublin, Trinity College Dublin where she received a 1:1 in her MSc in Biodiversity and Conservation.

Chapter	Contributor	Additional Details
	Rita Mansfield	Rita is an Associate Director with 20 years' previous experience as a technical lead within the environmental and planning services sector. She specialises in statutory consent and environmental assessment for large scale public infrastructure projects in the energy, water (including flood relief schemes) and transport sectors. She is a qualified ecologist with experience in environmental impact assessment, planning applications (conventional and strategic infrastructure development), climate adaptation, Appropriate Assessment, foreshore licensing, Water Framework Directive, integrated catchment management, and stakeholder engagement. Rita has held numerous licences under the Wildlife Act and Habitats Directive for disturbance to species which included mitigation (e.g. construction of artificial otter holt, bat exclusion). Rita has provided advice on ecological / environmental design to various private and public sector clients, which included the development of contract requirements for Transport Infrastructure Ireland (TII) for contracts tendered using both the PPP and D&B.
9 – Traffic and Transportation	Leigh Doyle	Leigh is a Project Engineer at Fehily Timoney and Company with 3 years experience working in the Energy and Planning department. He holds a ME degree in Civil, Structural and Environmental Engineering from UCC. Leigh currently works on renewable energy projects preparing traffic and transport chapters of the EIAR for wind farms, Environmental and Planning Reports for solar farms, and grid infrastructure developments. He also has experience in the design of renewable energy developments. He conducts walkover surveys inspecting environmental constraints on site and carries out site access assessments for several wind and solar farm sites to ensure the desired entrances meet TII guidelines.
	Trevor Byrne	Trevor works as an Associate Director for Fehily Timoney and Company. Trevor holds a master's degree in Sustainable Energy Systems from the University of Edinburgh and an honours degree in Civil Engineering following his studies at Edinburgh Napier University and Cork Institute of Technology. Trevor is a senior project manager within the Planning and Energy division at FT and is a chartered engineer with Engineers Ireland. His primary area of expertise is in the design and construction of renewable energy projects and urban developments.

Chapter	Contributor	Additional Details
		Trevor gained much of his experience working in the UK renewable energy industry and has delivered a wide variety of projects employing different technologies including onshore wind, hydroelectric and solar PV. He also has significant experience working in the Irish construction industry and in the United States on a variety of environmental projects focusing on renewable energy, solar PV, water treatment and surface water and wastewater treatment projects using green infrastructure. Trevor has considerable environmental engineering and environmental impact assessment experience and is a proven project manager with a track record in successfully guiding large scale projects through the consenting process as well as construction stage. He also has significant on-site experience relating to managing the construction of renewable energy developments and environmental coordination roles.
10 – Population and Human Health	Conor Auld	Conor holds a MSc in Urban and Rural Design (Commendation) and BSc in Environmental Planning (2.1), both from Queen's University Belfast. He also holds an Advanced Diploma in Planning and Environmental Law from the Honorable Society of Kings Inns. Conor is a Senior Planner with in excess of 7 years of professional experience in private and public sector roles in Ireland and the United Kingdom; over 6 years having been spent working in private sector planning in Ireland. Conor has worked on a variety of renewable projects throughout Ireland.
11 – Noise and Vibration	John Cullen and Maureen Marsden	This Chapter has been prepared by John Cullen and Maureen Marsden. John is an Environmental & Acoustic Engineer with seven years' experience in the assessment of noise and vibration. John is a member of the Institute of Acoustics and Engineers Ireland. Maureen is an Acoustic Engineer with a Master of Engineering in Acoustics and Vibration and over 20 years' experience in noise and vibration assessment. She is a member of the Institute of Acoustics and Engineers Ireland.
12 – Cultural Heritage	Kate Robb	Ms Robb is a qualified archaeologist and an EIA heritage consultant, with over 15 years' industry experience and has been involved in the preparation and production of Cultural Heritage EIAR for a wide range of large-scale projects (including renewable projects), for both public and private developments.

Chapter	Contributor	Additional Details
13 – Landscape and Visual	Cian Dowling	This LVIA was prepared by Cian Doughan, Associate Director at Macro Works Ltd of Cherrywood Business Park, Loughlinstown, Dublin 18; a consultancy firm specialising in Landscape and Visual Assessment and associated maps and graphics. Macro Works' relevant experience includes a broad range of infrastructural, renewable energy, industrial and commercial projects since 1999, including numerous urban, residential, and mixed use development projects.

1.3 Site Location Details

The application site is located within the townland of Ballynahone, near the town of Buncrana Co. Donegal, adjacent to the Trillick 110 kV Substation. 'The Drum' local road runs through the site, with the location of the proposed UTF Transformer Compound to the west and the proposed energy storage compound to the east.

The surrounding landscape is mostly used as farmland and forestry with inland peat bogs located to the east of the site. The site contains semi-mature coniferous forestry plantation. There are a number of one-off rural dwellings located near the site, in addition to a farm/construction yard and a gun club.

Topography of the site slopes gently from west to east. The Mill River runs adjacent to the eastern edge of the site flowing from south to north eventually passing through Buncrana to the sea.

The site is well linked by road to the nearby town of Buncrana.

Figure 2-1 shows the extent of the red line boundary for the proposed development, which is further detailed in the Site Location Plan drawings enclosed as part of this planning application.

The relevant Development Plan is the County Donegal Development Plan 2024 - 2030. The lands contained within the red line boundary are owned by a private landowner who has an agreement with FuturEnergy Ireland Development DAC to construct the development on their lands. A letter of consent from the landowners is included as part of the planning application pack.

1.4 Planning History

1.4.1 Subject Site

A desktop review of the Donegal County Council Planning Application Database indicates there are no relevant planning applications for the subject site.

1.4.2 Adjoining Lands

A desktop review of the Donegal County Council Planning Application Database and An Bord Pleanála Case Files indicates two applications have been permitted on lands within 500m of the application site. These are detailed in Table 1-1 below.

Table 1-1: Permissions Adjacent to Development Site

Planning Ref.	Development	Proximity To Site	Status
1851230 / ABP Ref. 305861-19	Proposed 30-year operational Wind Energy of 6 Turbines and associated 17.6km Grid Connection from the turbine site to Trillick substation.	Wind Farm: 10km (E) Grid Connection: Traversing southern boundary of Site	Granted at appeal 20 April 2021
2150351	Demolition of existing stone wall steads and erection of a dwelling with wastewater treatment system and percolation area, connection to public services and all associated works.	Adjacent to site, southern side of site boundary	Granted 15 April 2021
2150444	(1) demolition of existing dwelling due to defective mica blockwork granted under planning permission ref:10/70147 (2) erection of a replacement dwelling with connection to existing effluent treatment plant and services and all associated site development works previously granted under planning permission ref: 10/70147	Ca. 200m SE of site	Granted 7 July 2021
2151186	Demolition of existing dwelling due to defective mica blockwork, erection of replacement dwelling with	Ca. 380m N of site	Granted 13 September 2021

Planning Ref.	Development	Proximity To Site	Status
	connection to existing services and all associated site works		
2460638	Raising existing ground levels of landholding to improve the land for agricultural purposes including all other site development works	Ca. 200m SE of site	Granted with conditions 15 August 2024

1.4.3 Large Scale Developments in the Vicinity

An assessment was also undertaken of all large-scale developments within 15 km of the subject site, this was conducted via desktop and assessed all available applications on Donegal County Councils Planning Application Database as well as the An Bord Pleanála database.

These are listed in Table 1-2 below.

Table 1-2: Large Scale Developments in Vicinity of the Proposed Development

Planning Ref.	Development	Proximity To Site	Status
1650829	Alterations to the existing station, consisting of the erection of 1no 110kv/mv transformer and associated transformer bay, 110kv busbar extension, 2no sectionalising disconnects and associated site works	Ca. 150m N of site boundary	Granted 21 July 2016
ABP Ref: 312659	Glenard Wind Farm - Windfarm development including 15 no. wind turbines, 1 no. 110kV electrical substation, 110kV connection line and all associated and ancillary works.	Ca. 3.6km east of eastern site boundary	Lodged (04.02.2022)
1650335	A ten year duration for a proposed two wind turbine development. The development will consist of the construction of two wind turbines comprising tower, nacelle and composite fibre rotor blades with a hub height of up to 78 metres, a rotor blade diameter of up to 82 metres, and thus a blade tip height of up to 119 metres with a steel tower with concrete section. The proposed development also includes external wind turbine transformers, turbine foundations, hardstands and assembly areas; new access tracks; and use of approved access track and access permitted under planning permission reference 10/70075 for an adjacent wind turbine; electrical control building; associated drainage works; underground electrical cable and associated communication cables; with all ancillary development and associated site works	Ca. 1km N of site boundary	Granted 13 April 2017

Planning Ref.	Development	Proximity To Site	Status
1951534	Continuation of quarrying activity for a 25 year period over an area of approximately 17.8 ha; extraction of rock by blasting and rock breaking means from an area of 11.3 ha. (within 17.8 ha. Area); processing of rock using fixed and mobile plant and washing of material; continuation of use of the existing workshop, office, canteen, toilet facilities, weighbridge, wheelwash, settlement lagoons and all other ancillary facilities. Construction of refuelling area and attenuation & settlement lagoons; landscaping and restoration of the site and all associated ancillary facilities/works.	Ca. 1.5km W of site boundary	Granted 28 November 2019
1651729	10 year duration for; (a) retention and completion permission of existing wind turbine foundation, access track, drainage and hardstand area, (b) proposed additional hardstand area with drainage and proposed cabling, (c) proposed e82 wind turbine of 119 metres total blade tip height, turbine transformer and with all ancillary development and associated site works	Ca. 2km NE of site boundary	Granted 10 March 2017
1651540	10 years duration for a proposed mv substation building with all ancillary development and associated site works; as located within the planning approved wind turbine assembly area granted under planning authority register reference 14/51295 at this site	Ca. 2.5km N of site boundary	Granted 13 January 2017
2461158	(1) single storey extension housing 6 one bed wards and a waiting area, (2) a single storey extension providing a visitors room, (3) regrading existing ramp and installing new glazing to same, (4) modifying existing single storey waiting area, blocking up 2 no. Windows and providing 1 no. Large full height window with adjacent new wc, (5) new single storey canopy, 2 no. Windows and 1 no. Double door to form an ambulance entry, (6) new single storey canopy to existing single storey day hospital entrance, (7) forming a larger opening to the existing day room and inserting 2 no new windows and 1 no. Double door to same, (8) existing single storey store to be enlarged with 1 no. New window and door, (9) existing single storey smoking room to be redesigned as a new day room with existing windows omitted and replaced with 1 no. Double door and 2 no. Windows, (10) reuse of existing single storey ward/consulting room as staff changing areas, (11) internal minor refurbishments, with adjacent new wc, (12) new 60,000 litre single storey fire-fighting water storage tank and associated landscape and site development works	Ca. 3km NW of site boundary	Pending

Planning Ref.	Development	Proximity To Site	Status
2461260	Construction of 2 no. New single storey industrial buildings (each 583.6m2), with each comprising of 4no. Individual industrial units (8 units in total), along with connection to existing services. A natura impact statement (NIS) accompanies this application	Ca. 3km E of site boundary	Pending
1650168	(I) demolition of all existing school buildings and the removal of all temporary mobile classroom buildings, (ii) construction of a single-two storey primary school building, scoil íosagáin (6,322sq.m gross floor area); with associated external signage. The constituent elements of the new school building comprise: (a) single -two storey 25 general classroom and 9 special needs classroom element including library, therapy rooms, offices/groups rooms/toilets, staffroom, stores and associated ancillary accommodation, (b) double height general purpose assembly hall/dining hall, (for school use), (iii) site development works including revisions to vehicular/ pedestrian & cycle access arrangements to provide car and bus set-down spaces; including 56 no. Standard car parking spaces, 3 no. Universally accessible parking spaces and cycle parking spaces, and a new vehicular access from st. Mary's road; (iv) 3 no. Ballcourts. The proposed development also includes hard & soft landscaping (including boundary treatments, school garden and site attenuation), and associated site development and services works	Ca. 3km NW of site boundary	Granted 12 September 2016
1851075	Construction of a running track around existing football pitch and all associated site development works	Ca. 5km north of site boundary	Granted 31 August 2018
1550177	Change of use of the existing two-storey sisters of mercy convent building from residential (convent) use to educational use; external works to convent building including demolition of existing side porch, provision of new escape doors and replacement of existing windows; internal refurbishment works to convent building to provide new classrooms, prayer room, horticulture room, kitchen, toilets and additional ancillary teaching /administration accommodation; along with associated external siteworks, new one-way traffic system with parking and drop -off area	Ca. 5km NW of site boundary	Granted 1 July 2015

Planning Ref.	Development	Proximity To Site	Status
1750750	A wildlife sanctuary incorporating reception building, vehicular entrance with car park, wildlife shelters/rehabilitation units, feed shelters/pig house/owl barn, open viewing areas, construction of 3m high rock pile at goat enclosure, duck pond/otter pond/newt & frogs pond, otter above and below water viewing area, salmon pool with adjacent filtration unit, 2.5m high enclosure fences to badger, fox, red deer and goat areas, 1.8m high enclosure fence to fallow deer, squirrel and otter areas, 1.5 high enclosure fence to pot belly pigs area with on-site sewage treatment facility incorporating septic tank, reed bed, wetlands and ponds and planting to enhance existing wildlife habitat and all associated site development works	Ca. 5km SE of site boundary	Granted 25 January 2018
2460437	Erection of 43 no. Dwellings, connection to existing services and all associated site works	Ca. 5.5km NW of site boundary	Granted 19 June 2024
2051213	(1) construction of approximately 1,150m of 375mm diameter below ground gravity sewer upgrades on Cockhill road from the existing Westbrook pumping station on Westbrook road to a point approximately 140m northeast of the old Cockhill bridge on the Cockhill road, (2) upgrades to the existing Westbrook pumping station to include the construction of a new subterranean storm storage tank; subterranean storm overflow chamber and screen; storm return pumps; 5.0m high ornate ventilation stack; improvements to the existing site entrance; a temporary construction access from the Cockhill road (r-238); landscaping of the site; new boundary wall/fence and all associated site works.	Ca. 6km N of site boundary	Granted 1 September 2020
1651334	(A) two e82 wind turbines, with a hub height of 78m, blade diameter of 82m and blade tip heights of 119m (b) an access haul route (c) a substation	Ca. 6km E of site boundary	Granted 14 December 2016
1750839	Erection of a marquee. Also retention permission for the following (1) additional covered entrance and covered link to marquee, (2) ancillary toilet block, kitchen and store and associated works including connection to existing approved treatment system serving Drumhalla House	Ca. 6km W of site boundary	Granted 20 July 2017

Planning Ref.	Development	Proximity To Site	Status
1650150	Erection of proposed workshop and office space including parking, fencing and signage, treatment plant and percolation area, relocation of weighbridge, relocation of agricultural road, depositing of spoil from excavations within site, retention of extensions to existing laser, machine and main workshops, retention and completion of access road and road entrance, closing of existing entrances, demolition of existing box store and associated site works	Ca. 7km NE of site boundary	Granted 16 February 2017
1751265	Construction of a single storey control building/20kV substation to facilitate 2 no. Approved wind turbines (planning reference: 14/51149) using the approved site entrance and access tracks. The proposed development will also include additional drainage works to connect to approved drainage channels; underground electrical cables; and all ancillary development and associated site works	Ca. 7km NE of site boundary	Granted 8 November 2017
2351543	A 10 year planning permission for a proposed wind turbine with a 30 year operational life from the date of commissioning. The proposed wind turbine site will consist of 1 no. three bladed wind turbine with a maximum base to blade tip height of up to 119.33 metres and will include turbine transformer, turbine base and foundation, turbine hardstand and temporary set-down area, construction of new access track, junction and turning area, on-site drainage management works , 1 no. new site entrance within Sorne Wind Farm and with all other ancillary and associated development and infrastructure including general and excavation works	Ca. 8.3km E of site boundary	Extension of duration granted 30 November 2023
1650297	Erection of a single 2.3 MW wind-turbine with hub height of 64 metres, a rotor diameter of 71 metres and base to blade tip height of 98.140 metres. The proposed wind turbine will also include a turbine hardstand, a new access road, drainage, underground communication and power cables and all associated site works and ancillary development.	Ca. 10km SW of site boundary	Granted 21 April 2016
1650437	Construction of 19 no. Houses comprising of 12 no. Two storey 3 bed semi-detached, 4 no. Two storey 4 bed semi-detached, 1 no. Two storey 3 bed detached and 2 no. Two storey 4 bed detached and connection of all proposed houses to all site and public services	Ca. 10km S of site boundary	Granted 11 August 2016

Planning Ref.	Development	Proximity To Site	Status
1751454	Construction of 4 no. native oyster spatting ponds	Ca. 10km E of site boundary	Granted 1 June 2018
1851341	Construction of a warehouse storage unit, relocation of car parking area, including all associated site works, advertisement signage and connection to existing on-site services	Ca. 10km SE of site boundary	Granted 31 May 2019
2461231	11 no. 2 storey terraced townhouses in two blocks with retaining wall to rear of townhouses with connection to existing services and all associated site development works previously granted under planning ref. No. 22/50916. A natura impact statement (NIS) will form part of this application	Ca. 10.5km NW of site boundary	Pending
2150870	Construction of an extension to existing caravan park consisting of 30 no. new static caravans, new sewage treatment plant, new access roads, walkways & all ancillary services	Ca. 14km NW of site boundary	Granted 21 July 2022
1550070	Development of a section of underground 33kv electrical cable to connect two sections of the consented Aught Wind Farm (planning ref. 11/70191). The development will comprise a section of underground 33kv electrical cable approximately 1,000m in length, micro -siting of turbine 10 and turbine 11 by approximately 18m and 10m respectively, the reduction of the landholding boundary by an area of approximately 5.87 hectares and inclusion of a development exclusion zone covering approximately 3.28 hectares, upgrading of public road l-1811 and associated site works	Ca. 15km E of site boundary	Granted 20 March 2015
1550117	10 years duration for a proposed single wind turbine development. The proposed development will consist of the construction of one wind turbine comprising tower, nacelle and composite fibre rotor blades with a hub height of up to 85 metres, a rotor blade diameter of up to 82 metres, and thus a blade tip height of up to 126 metres with a steel tower with concrete section. The proposed development also includes external wind turbine transformer, turbine foundation, hardstand and assembly area; new access track and use of approved access track and access permitted under planning permission reference 14/51295 for an adjacent wind turbine; associated drainage works; underground electrical cable and associated communication cable; with all ancillary development and associated site works	Ca. 15km E of site boundary	Granted 26 March 2015

Planning Ref.	Development	Proximity To Site	Status
1851455	Construction of an access track & associated site works including drainage and underground electrical cables to serve permitted single wind turbine (planning references 16/50297 & 11/40003 refer)	Ca. 15km W of site boundary	Granted 22 February 2019

2051157	1)construction of a new wastewater treatment plant (WWTP) in the townland of Tirroddy with associated and ancillary development works including internal access road, inlet works, WWTP process tanks, sludge storage tanks, chemical storage tanks, ancillary treatment units, administration & ESB sub-station building, sludge press building, internal pumping stations, surface water attenuation pond, 2.4m high boundary fence around the perimeter of the WWTP works, 1.2m fencing around the site boundary, entrance via an existing Coillte roadway and entrance onto l-5612-1 and widening and strengthening of l-5612-1 2)construction of approximately 1,590m of treated effluent outfall pipeline in the townlands of Tirroddy and Brownknoe, including approximately 160m marine section & outfall diffuser located in Lough Swilly 3) construction of 1 no. Main wastewater pumping station at Ramelton in the townland of Ramelton including all ancillary development works, demolition of existing single-storey building, flood protection measures, below ground storage tank & structures, pump house building, ESB sub-station unit, rubble stone perimeter walls, new entrance onto castle street, reconstruction of an existing stone boundary wall approximately 15m long along castle street and connection to existing storm outfall 4)construction of 1 no. Main wastewater pumping station at Rathmullan in the townland of Rathmullan & Ballyboe including all ancillary development works, flood protection measures, below ground storage tank & structures, pump house building, rubble stone perimeter walls, ESB sub-station unit, demolition of an existing subterranean municipal septic tank, new turning hammerhead at the end of the existing turning circle at abbey view estate, new entrance to abbey view estate, temporary working area during construction and connection to existing storm outfalls 5)construction of 1 no. Network wastewater pumping station at Rathmullan in the townland of Rathmullan & Ballyboe including all ancillary development works, flood protection measures, below ground pumping station, storage tank & structures, low-level control kiosk, 7.6m high ornate ventilation stack, rubble stone perimeter walls, demolition of an existing subterranean municipal septic tank, new entrance onto main street, temporary working area during construction, temporary entrance onto main street during construction, relocation and	Ca. 15km W of site boundary	Granted 24 June 2021

Planning Ref.	Development	Proximity To Site	Status
	upgrading of existing storm drain and connection to existing storm outfall.		
1851230	Proposed 30-year operational Wind Energy of 6 Turbines and associated 17.6km Grid Connection from the turbine site to Trillick substation.	Wind Farm: 10km (E) Grid Connection: Traversing southern boundary of Site	Permitted since 2021

1.5 Permission Duration

It is requested that **the duration of the permission** i.e., the period in which the development can be commenced, is for a **period of ten years** from the date of grant of planning permission pursuant to Section 41 of the Planning and Development Act (as amended).

Section 41 of the Planning Act states that the Consenting Authority may:

> *"Having regard to the nature and extent of the relevant development and any other material considerations, specify the period, being a period of more than 5 years, during which the permission is to have effect".*

The proposed development is dependent on achieving a suitable connection to the electricity grid network which is under the control of EirGrid or ESB Networks.

Though such guidelines are not specifically available for developments of the type proposed, the Department of the Environment, Heritage and Local Government's Planning Guidelines on Wind Farm Developments states the following:

> *"Planning Authorities may grant permission for a duration longer than 5 years if it is considered appropriate, for example, to ensure that the permission does not expire before a grid connection is granted. It is, however, the responsibility of the applicants in the first instance to request such longer durations in appropriate circumstances"*

In addition, the Department of the Environment, Heritage and Local Government's Development Management Guidelines for Planning Authorities[1] further notes that:

[1] Department of the Environment, Heritage and Local Government. 2007, Development Management Guidelines for Planning Authorities.

"Planning Authorities may grant permission for a duration longer than 5 years if they see fit, but it is the responsibility of applicants in the first instance to request such longer durations in appropriate circumstances".

The timing of the construction and installation of the proposed development is predicated on a number of factors, not least of which is the surety of achieving planning permission for the development, as this provides the context to pursue financial support mechanisms and apply for a grid connection from ESBN/EirGrid. It is for this reason that a ten-year permission is sought.

1.6 Operational Life

The Applicant requests that the development be granted planning permission for an operational period of 30 years – i.e. that the planning permission specifies an operational period of 30 years from the date of commissioning of the LDES Facility.

On decommissioning of the battery energy storage system, all equipment in the LDES and UTF compounds shall be removed from the site along with all ancillary infrastructure including storage containers, water treatment system, water storage tanks, perimeter fencing and gates. Hard standings and drainage infrastructure shall be left in situ.

Buried cables shall be removed for recycling with buried ducting left in situ.

It is expected that the decommissioning phase will take no longer than 6 months to complete.

A detailed decommissioning plan will be agreed in advance of construction with Donegal County Council.

2. DESCRIPTION OF THE PROPOSED DEVELOPMENT

2.1 Overall Development Description

The proposed development, on an overall site of c.5.8 hectares, comprises the following:

- Long Duration Energy Storage (LDES) Compound with a total surface area of c. 2.9 Ha containing 248 no. battery energy storage units in the form of metal shipping containers [approximately 12.2 m (L) x 2.6 m (W) and 2.9 m (H) each] and associated ancillary control and ventilation equipment;
- Installation of an onsite transformer compound (c.3,600 sq m) to facilitate an under-the fence connection to the adjacent Trillick 110kV substation. The transformer compound will include a control building of c.27 sq m, a 110 kV transformer, associated electrical equipment, and an up to 18 m high lightning protection monopole mast;
- A temporary construction compound with a total surface area of c. 1,500sq m. c. 515m of new and upgraded access tracks;
- 3 no. entrances from the L-7231 public road comprising the upgrade of 1 no. existing entrance and creation of 1 no. new permanent access and 1 no. new temporary access for the construction and operation of the facility;
- Underground electrical and communications cabling between the proposed LDES compound and the proposed on-site transformer compound which will cross under the L-7231 public road;
- Security lighting;
- Pole mounted CCTV and communications mast;
- On-site freshwater storage tank including fresh water treatment unit in the form of a metal shipping container;
- On-site drainage system and associated vegetated attenuation pond;
- A storage container in the form of a metal shipping container;
- Sound reflective barriers to a height of 4 m;
- Security fencing and gates;
- All associated ancillary site development, services and clearance works including tree felling of c.4.7 Ha of conifer plantation, landscaping and planting.

Figure 2-1 shows the location of the proposed layout and Figure 2-2 shows the layout of the proposed development.

Details of construction methodologies associated with the proposed Development are contained in the Construction and Environmental Plan prepared for this project (enclosed as part of this application).

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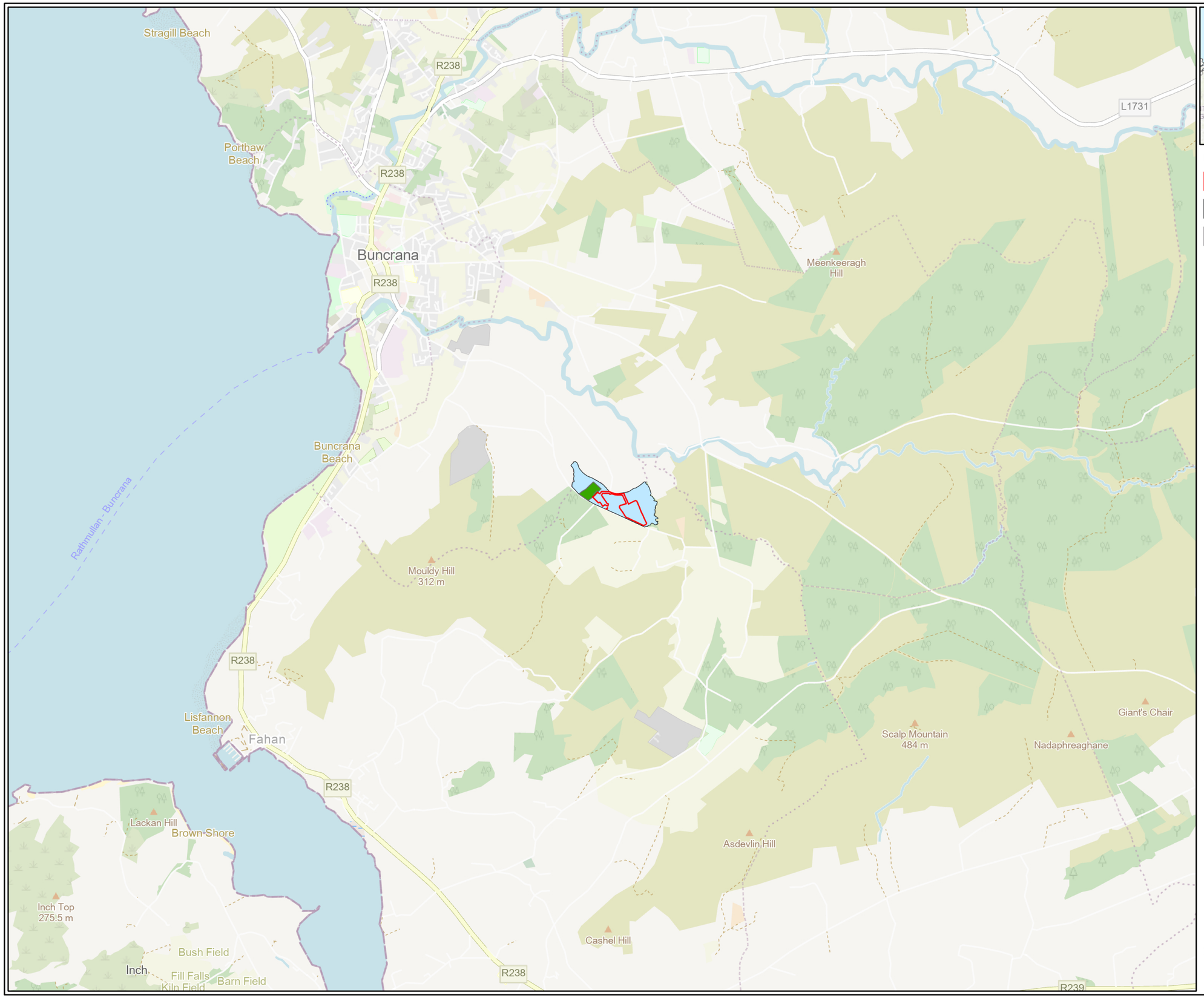

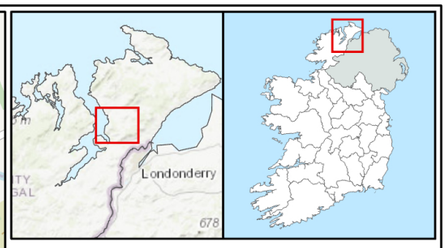

Legend

- Proposed Development Boundary
- Landowner Folio Boundary
- Trillick 110kV Substation

TITLE:	Site Location Plan		
PROJECT:	Ballynahone Long Duration Battery Storage Planning and Environmental Services		
FIGURE NO:	2.1		
CLIENT:	FuturEnergy Ireland		
SCALE:	1:40,000	**REVISION:**	0
DATE:	9/18/2024	**PAGE SIZE:**	A3

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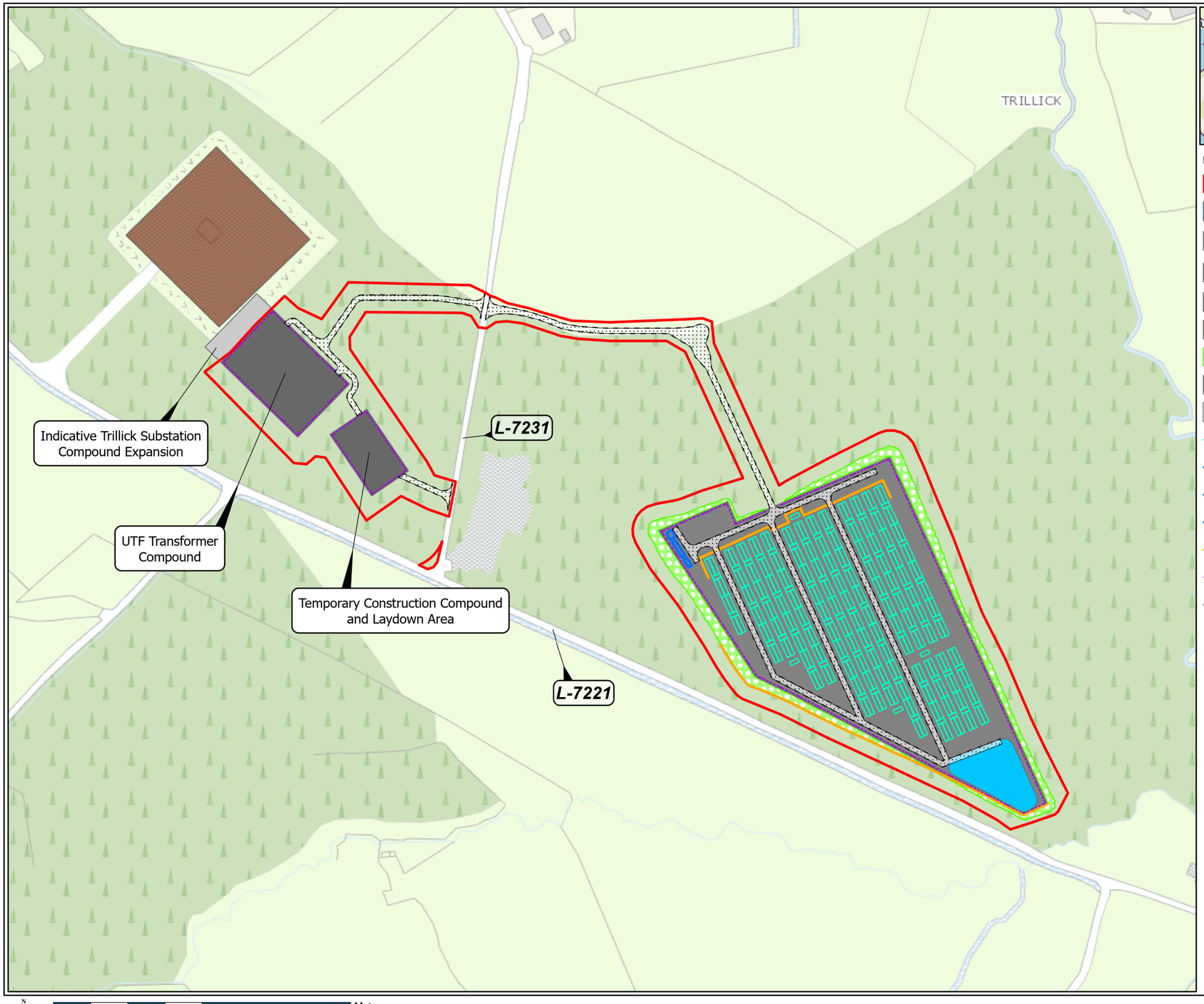
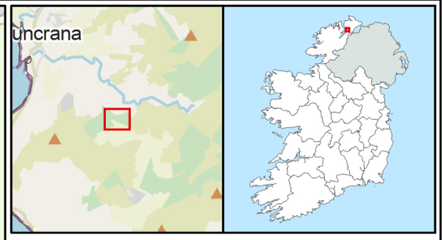
Path: R:\Map Production\2023\P23-117\Workspaces\P23-117_Figure_2_2_Site_Layout.aprx





Legend

- Proposed Development Boundary
- Surface Water Attenuation Pond
- Indicative Trillick Substation Compound Expansion
- Temporary Construction Compound and Laydown Area
- UTF Transformer Compound
- Existing Trillick Substation Compound
- Proposed Native Woodland
- Embankments
- Access Roads
- Battery Storage Unit
- Fresh Water Storage Tank
- Reverse Osmosis Water Treatment Unit
- Storage Container
- Sound Barrier
- Security Fence
- Access Track

Note: Please refer to Landscape Plan for proposed landscaping and planting.

TITLE: Site Layout Plan			
PROJECT: Ballynahone Long Duration Battery Storage Planning and Environmental Services			
FIGURE NO:	2.2		
CLIENT:	FuturEnergy Ireland		
SCALE:	1:2,500	**REVISION:**	0
DATE:	9/18/2024	**PAGE SIZE:**	A3

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2.1.1 LDES Compound

The proposed LDES Facility is located c. 150 metres east of the Trillick 110kV Substation as shown in Figure 2-1-1.

The main LDES compound is contained within an area measuring c. 4 hectares. This is the area containing the LDES compound which includes the hardstand for the LDES battery units, acoustic barriers, reverse osmosis water treatment unit, fresh water storage, surface water treatment and drainage infrastructure and all associated earthworks and landscaping.

Other ancillary details such as lamps, security palisade fencing, compound gates, permanent access tracks and associated drainage will be required as standard.

The compound hard standing formation will consist of compacted hardcore on geo-textile membrane. The stone required for the construction of the internal access roads will be sourced from licenced quarries in the vicinity of the proposed development. The location of licensed quarries, waste facilities and haulage routes are identified in Chapter 9 of this report.

Sections of the hard standing shall be paved to facilitate vehicular access and parking during the operational phase of the project.

The general arrangement of the LDES compound is shown on 0100 series planning application drawings and Figure 2.2. Details of all internal infrastructure and equipment associated with the LDES compound are presented in 0300 and 0501 series planning application drawings.

2.1.2 Technology Description - Iron-Air Batteries

The battery technology deployed on the site will be iron-air, provided by Form Energy. Deep grid decarbonization requires new cost-effective technologies capable of storing electricity for multiple days and providing this power back during renewable energy lulls, thermal power plant or transmission outages, fuel shortages, and extreme weather events. This project will utilize Form's rechargeable iron-air battery, which when fully charged, can continuously dispatch electricity for 100 hours at system costs competitive with legacy power plants. By providing the capability to deliver 100 hours of continuous discharge, when paired with the abundant renewable energy of Ireland's North-West, Form's iron-air system provides critically needed clean, firm capacity to reduce power system emissions while maintaining the highest levels of system reliability.

Iron-air batteries, which were first explored by NASA in the 1970s, are based on the principle of reversable rusting. While discharging, the battery breathes in oxygen from the air and converts iron metal to rust. While charging, the application of an electrical current converts the rust back to iron and the battery breathes out oxygen. Form has chosen this technology for many of the same reasons as those that make it an attractive choice for Ballynahone:

- Safety: There is no risk of the thermal runaway mechanism common to lithium-ion batteries. The cells consist of electrodes and iron anodes submerged in a water-based, non-flammable electrolyte. There is no path for uncontrolled chain reactions that could lead to fire risk. The batteries also contain no heavy metals.

- Proven: Iron-air battery technology was proven viable as early as the 1970s, but the need for grid-scale electricity storage was not there. Form Energy has advanced this technology through extensive subscale and full-scale testing, along with a field deployment that has been operational since Q2 2023. By the time of construction (if consented) of the proposed Ballynahone site, Form expects to have delivered 5.5GWh of battery capacity to more than half a dozen customers, which include the some of the largest utilities in the United States. These will provide invaluable learnings to continuously improve Form's safety approach and ensure efficient operation.

- Circularity: Iron forms the bulk of the battery by weight and can be recycled indefinitely. As such, iron-air technology offers significant end-of-life advantages, and can support Ireland's transition to a circular economy.

A separate technical report on the proposed technology prepared by FORM Energy is enclosed as Appendix 1 of this Report.

2.1.3 UTF Transformer Compound

The proposed UTF Transformer Compound measures a total area of approximately 3,600 sq m and includes a power transformer, modular control buildings and all ancillary equipment associated with the UTF grid connection.

The hard standing formation will consist of a minimum 500 mm compacted hardcore on geo-textile membrane.

The stone required for the construction of the internal access roads will be sourced from licenced quarries in the vicinity of the Project. The location of licensed quarries, waste facilities and haulage routes are identified in Chapter 9 of this report.

Sections of the hard standing shall be paved to facilitate vehicular access and parking during the operational phase of the project.

The proposed UTF Transformer Compound and associated works will consist of the following elements:

Under the Fence Cabling

The proposed development UTF Transformer Compound will consist of one 33kV/110kV Power Transformer Unit (final MVA to be confirmed) with associated electrical primary plant components. Components include Cable Sealing End (CSE), Surge Arrestor (SA), Transformer Disconnect / Earth Switch Disconnect (DT/DEM), Combined Current /Voltage Transformer (CT/VT), Circuit Breaker (CB), Lightning Mast (LM), Post Insulator and Busbar.

Modular Control Building

Development will consist of one Modular Control Building to house switchgear and control panels for the operation and protection requirements for the proposed development. The finish of the modular buildings is High Grade steel.

The proposed building has a maximum height of c. 4m and gross floor area of c. 27 sq m. Associated underground electrical cabling will be fed from this module to connect primary plant equipment. All earthing requirements will be connected via an underground earth grid.

Additional Grid Code Compliance Equipment Components

- Backup Diesel Generator

- Neutral Earthing Resistor (NER)
- Auxiliary House Transformer
- Interface Kiosk
- Marshalling kiosks

Ancillary Components

Other ancillary details such as lamps, security palisade fencing, compound gates, permanent access tracks and associated drainage will be required as standard. 33kV underground cables will be utilised for long duration energy storage to support the penetration of renewable energy generation onto the National Grid. A single circuit 110kV underground cable will be fed from the Transformer Compound to the adjacent Trillick substation facility, for renewable export onto the Grid Network.

Design details of the proposed UTF Transformer Compound and associated works are shown in , and 2-5 below.

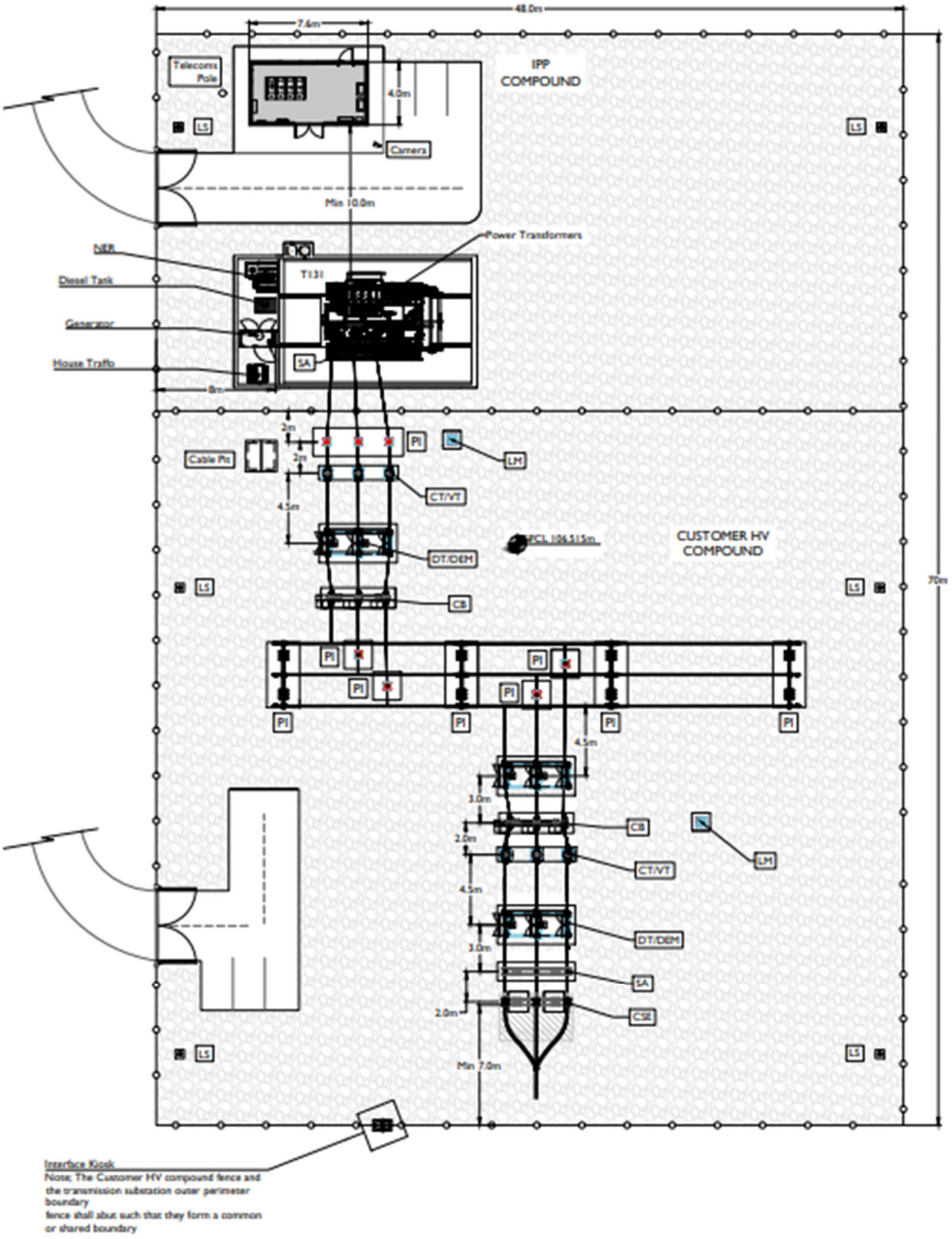

Figure 2-3: UTF Transformer Compound Layout Plan

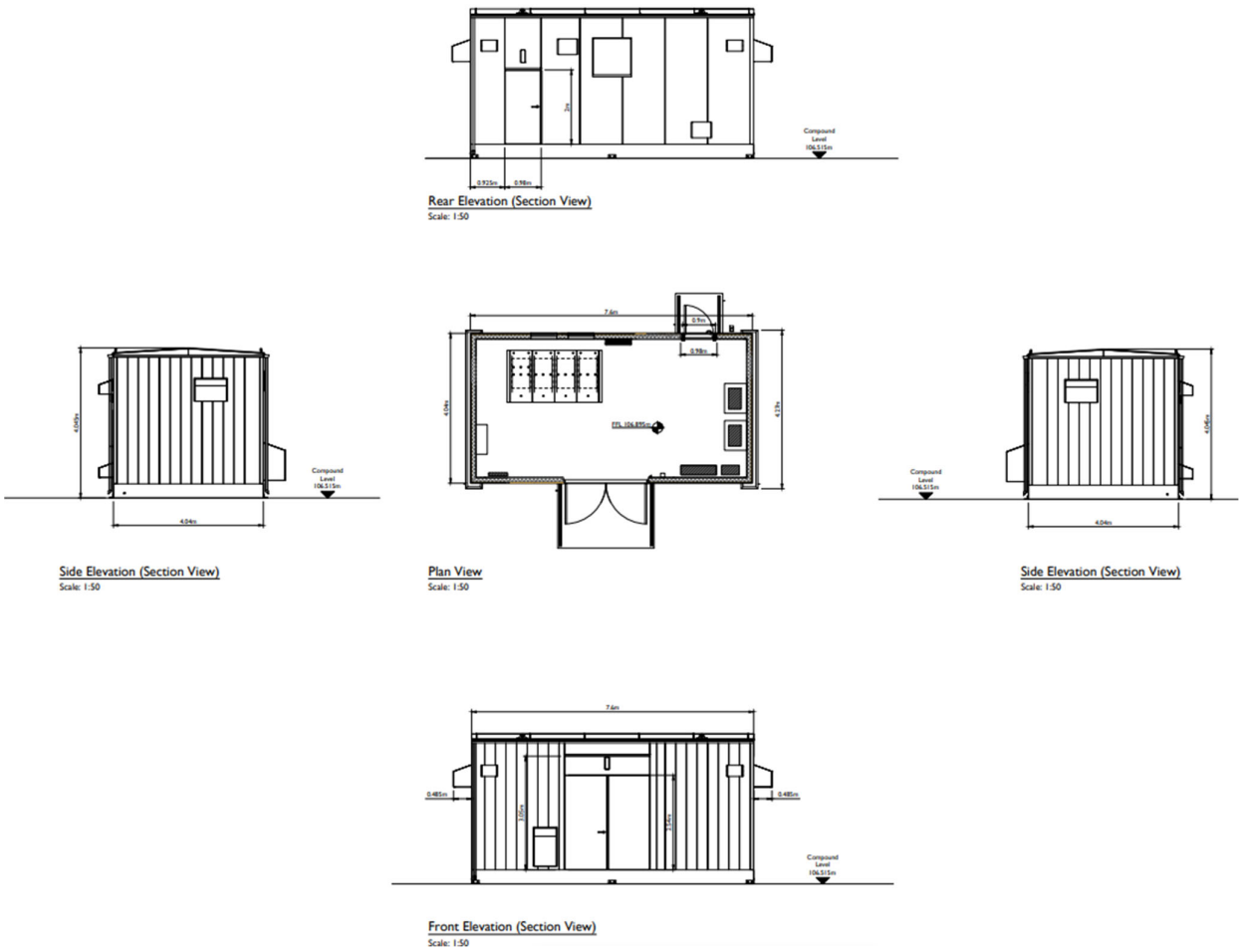

Figure 2-4: UTF Transformer Compound Modular Control Building Plan and Elevations

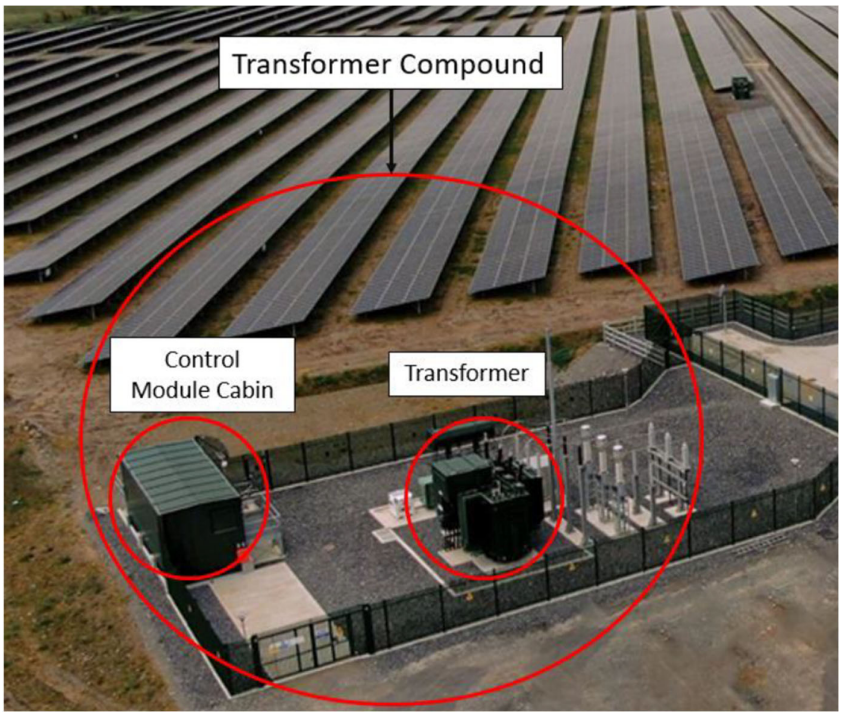

Figure 2-5: Example Photograph of UTF Transformer Compound (note example image associated with a solar farm, rather than LDES, however, shows the general arrangement of a UFT Transformer Compound)

2.1.4 Battery Energy Storage Units

Metal shipping containers housing the batteries [approximately 12.2 m (L) x 2.6 m (W) and 2.9 m (H) each] and associated ancillary control and ventilation units.

A typical design detail of the proposed battery storage units is shown in Figure 2-6 below.

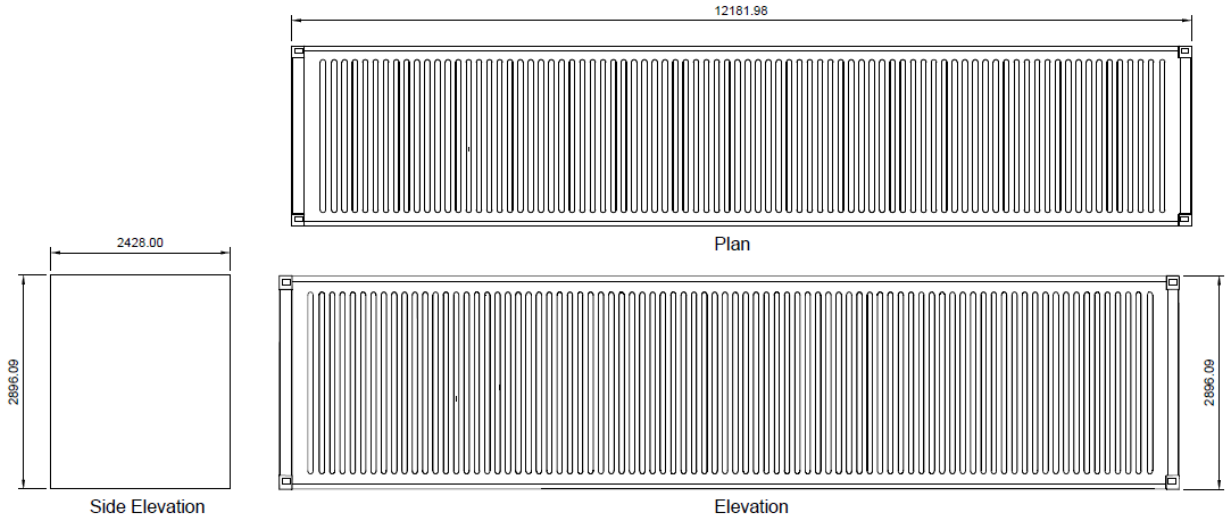

Figure 2-6: Typical Details of Battery Energy Storage Units

The general arrangement of the battery energy storage units is shown on 0100 series planning application drawings. Details of battery energy storage units are presented in 0300 series planning application drawings.

2.1.4.1 Technical Details of the Proposed LDES Technology

We refer the Planning Authority to the Technology and Compliance Overview, prepared by FORM Energy enclosed as Appendix 1 this Report. This provides technical details of the technology proposed technology as well as details compliance with relevant standards including fire safety.

2.1.5 Temporary Construction Compound

The surface area of the proposed temporary construction compound and lay down area is 1,500 sq m.

There will be welfare facilities during construction in the temporary construction compound. Containerised toilets and welfare units with storage tanks will be used to provide toilet facilities for site personnel during construction. These temporary facilities shall be regularly serviced throughout the construction stage and do not require a wastewater treatment system. After completion of construction, welfare facilities are not envisioned given that the battery facility will be unmanned.

2.1.6 Internal Access Roads

Internal access roads will allow for the construction of the development and future maintenance of the plant and equipment, which is likely to involve limited but regular maintenance visits by small vehicles such as vans. The road will be constructed of compacted gravel stone and measure 3.5 m wide and located as shown in the site layout plan.

The development shall include a total of c.515 m of new and upgraded access tracks.

Access roads shall be a combination of upgraded existing gravel tracks outside the compound perimeter fences, and paved internal roadways within the compounds.

Materials required for the construction of the internal access roads will be sourced from licenced quarries in the vicinity of the Project. The location of licensed quarries, waste facilities and haulage routes are identified in Chapter 9 of this report.

Details of internal access roads are presented in 0300 series planning application drawings.

2.1.7 Site Access

The locations of 3 no. proposed site access points to the L-7231 public road are shown in the proposed site layout plan in Figure 2-1.

The project includes the use and upgrade of an existing forestry entrance to access the LDES Compound for construction and operational purposes.

A new construction and operational access shall be created across the road from the above location to serve the UTF Transformer compound.

A temporary access shall be created directly to the south of the UTF Transformer Compound access to provide construction stage access only to the proposed temporary construction compound and laydown area as shown on the site layout plan. This access shall be permanently closed off and fully reinstated at the end of the construction stage.

Details of site entrances are presented in 0100 series planning application drawings.

2.1.8 Underground Electrical and Communications Cabling

Electricity from the LDES Facility shall be collected at medium voltage (up to 33kV) by an internal circuit of underground cables which will follow cable corridors contained within the LDES Compound. Underground electrical and communications cabling shall exit the LDES Compound along the proposed internal access roads associated with the LDES Compound and UTF Transformer Compound before terminating at the 33 kV/110 kV Power Transformer Units located within the UTF Transformer Compound.

Details of proposed underground electrical and communications cable trenching are presented in 0300 series planning application drawings. A copy of a Statutory Undertaker Letter is enclosed as part of this planning application.

2.1.9 Security Lighting and CCTV

Security lighting and CCTV will be mounted on 4 m high poles placed within the perimeter of the LDES Compound and UTF Transformer Compounds. Installed lighting would be both located and shielded to minimise light emissions beyond the perimeter of the site. This lighting will be Passive Infrared sensor (PIR) controlled and therefore not be on consistently. The lights respond to movement or are turned on the rare case that night work is required. Temporary lighting shall be used during the construction phase of the development but shall not remain illuminated outside of the construction activity within the Site.

Details of proposed security lighting and CCTV are presented in 0300 series planning application drawings.

2.1.10 Mains Water Connection

Fresh water shall be supplied to the site via a mains connection from the Uisce Éireann network. The connection shall involve approximately 1.4 km of new 50 mm diameter HDPE watermain with a new booster pumping station within the public road corridor.

A letter of feasibility from Uisce Éireann was issued on the 13th of May 2024 confirming the viability of the proposed connection arrangement. A copy of this letter is contained in Appendix 2 of this Report.

The general arrangement of the mains water connection is shown on 0100 series planning application drawings.

Subject to grant of planning permission, the Applicant will submit a connection application for agreement with Uisce Éireann prior to construction of the Proposed Development.

2.1.11 Surface Water Management

The LDES Compound site is characterised by existing manmade forestry drains draining to the east towards the Mill River, which runs adjacent to the eastern edge of the Site flowing from south to north, eventually discharging to the sea at Buncrana. The coastal area where the river meets the sea is part of the Lough Swilly SAC.

Natural drainage patterns within the site follow the topography which slopes gently from west to east draining towards the Owenkillew River.

A drainage design has been prepared for the site as shown on 0100 Series planning application drawings. The drainage design has been designed to take account of existing topography, land cover and existing hydrological features. Existing small forestry drains are present on the site draining towards the river (MILL (DONEGAL)_020). A number of these drains shall be removed as part of the construction of the proposed project and replaced by the proposed drainage system.

A key design philosophy employed for surface water management is the use of existing forestry tracks where available alongside the implementation of Sustainable Drainage Systems (SuDS). This design approach ensures that existing drainage patterns will be maintained throughout the site.

The drainage system will be constructed alongside compound hard standings and internal access tracks. Existing track drainage shall be retained.

Surface water runoff attenuation and drainage management are key elements in terms of mitigation against impacts on surface water bodies.

Two distinct methods will be employed in the management of construction surface water runoff. The first method involves keeping clean water clean by avoiding disturbance to natural drainage features, minimising any works in or around drainage features, and diverting clean surface water flow around excavations and construction areas. The second method involves collecting any drainage waste from works areas within the site that might carry silt or sediment, and to route them towards settlement ponds prior to controlled diffuse release over vegetated natural surfaces. There will be no direct discharge to surface water.

'Clean' water is separated from 'dirty' water utilizing interceptor drains. The interceptor drains will be installed on the upslope side of the construction areas. This will reduce the amount of water from construction area that will need to be treated before it can be safely discharged into the environment.

Access tracks and compound hard standings will be constructed from a permeable aggregate material to allow the runoff to infiltrate with paved surfaces kept to a minimum. The excess water will drain into swales which will be connected, during the construction stage, to the settlement ponds.

A key feature of the drainage design includes the construction of a large permanent wetland in the form of a vegetated pond with a surface area of over 1,100 m2 and over 250 m of filter trench drain which also act as tree planter boxes which will provide additional surface water attenuation throughout the operational life of the proposed development while also providing landscape vegetative screening.

Further details of the proposed drainage system can be found in the CEMP, prepared by Fehily Timoney and Company, enclosed as part of this planning application.

Details of the onsite water drainage system are shown on 0100 and 0501 series planning application drawings.

2.1.12 Wastewater Management

As the Proposed Development will be remotely operated, no sanitary facilities are proposed and therefore no wastewater treatment or storage is required for the operation of the facility.

As described in Section 2.1.4, there will be welfare facilities during construction in the temporary construction compound. Containerised toilets and welfare units with storage tanks will be used to provide toilet facilities for site personnel during construction. These temporary facilities shall be regularly serviced throughout the construction stage and do not require a wastewater treatment system.

A small amount of discharge water shall be produced by the onsite reverse osmosis water treatment system which will filter mains water before being circulated through the battery storage units. This water will be directed to the onsite surface water drainage system.

Based on the expected volume of fresh water required to operate the system identified by the Client, the estimated volume of discharge water from the reverse osmosis treatment system is 0.8 litres per minute. This discharge water is considered to be free of contaminants and can be accommodated within the designed surface water drainage system.

Details of the onsite water drainage system are shown on 0100 and 0501 series planning application drawings.

2.1.13 Security Fencing and Gates

The LDES Compound and UTF Transformer Compound will be secured by 2.4-metre-high palisade fencing along the perimeter and associated galvanised steel gates.

Appropriate safety signage will be displayed on the fencing and gates.

Details of fencing and gates are shown on 0300 series planning application drawings.

2.1.14 Tree Felling and Landscaping

Permanent felling of c. 4.7 ha of commercial forestry is required to accommodate the construction of development.

The felling area proposed is the minimum necessary to construct the proposed project. In advance of other construction works, clearance felling will commence on site and is expected to take over 12 weeks.

The felling will be the subject of a Felling Licence Application to the Forest Service prior to construction.

2.1.15 Decommissioning

On decommissioning of the battery energy storage system, all equipment in the LDES and UTF compounds shall be removed from the site along with all ancillary infrastructure including storage containers, water treatment system, water storage tanks, perimeter fencing and gates. Hard standings and drainage infrastructure shall be left in situ.

Buried cables shall be removed for recycling with buried ducting left in situ.

It is expected that the decommissioning phase will take no longer than 6 months to complete.

A detailed decommissioning plan will be agreed in advance of construction with Donegal County Council.

3. NEED FOR THE DEVELOPMENT AND PLANNING POLICY

3.1 Need for the Development

Energy storage is the counterweight to intermittent renewable generation capacity, such as wind and solar power, and enables balancing of the energy system by matching supply and demand. With a target of 80% renewable electricity from intermittent sources on our grid by 2030, Ireland will require a significant amount of energy storage in the years to come.

In the absence of renewable storage options, gas-turbines currently supply most of Ireland's dispatchable power generation capacity, though the lack of gas storage facilities on the island is a considerable concern with regards to energy security.

Long duration energy storage (LDES) will be crucial to our future energy systems and enable increasingly high levels of renewable penetration. As opposed to short duration storage that mainly provides system services, LDES allows for storing and dispatching energy on-demand rather than letting surplus renewable energy go to waste and using fossil fuel generation to cover deficits in times of low renewable generation.

There is no set definition yet for what duration qualifies a technology as "long-duration", though EirGrid's most recent definition is 8+ hours.

A key benefit of LDES is ability to reduce "dispatch down" of renewable power, which is a major hurdle for further deployment of renewable generation essentially involving "spillage" of renewable electricity. As such, dispatch down is the practice of deliberately reducing renewable generation.

This is usually due to supply outweighing demand or constraints originating from network or system considerations, such as limits on how much electricity power lines can carry or operational requirements to run thermal power stations. In 2022, c. 1.3 TWh[2] renewable electricity (8.5% of total generation) was dispatched down on the island of Ireland – a trend that is expected to continue growing with increasing renewable penetration.

LDES mitigates dispatch down by storing surplus energy until it is needed, or constraints are removed be it on an intra-day, inter-day, or even seasonal scale. In this way, LDES reduces reliance on fossil fuelled dispatchable generation, which today is required to cover demand in times of low renewable generation. Storage of surplus energy also provides the TSO with increased operational flexibility, which lowers the amount of grid investment required.

LDES plays a pivotal role in our energy transition and is identified as such in Climate Action Plan 2023 (CAP23). ESB Networks, Ireland's Distribution System Operator (DSO) covered the topic in their June 2023 publication Scenarios for 15-20% Flexible System Demand[3] highlighting the importance of medium- and long-duration storage for system flexibility.

Furthermore, EirGrid's *Shaping Our Electricity Future* (SOEF v1.1) Roadmap from July 2023 quantifies Ireland's requirement for LDES at an additional 2,400 MW and Northern Ireland's by 350 MW in 2030.

[2] EirGrid - Annual Renewable Energy Constraint and Curtailment Report 2022
[3] ESB Networks – Scenarios for 15-20% Flexible System Demand – National Network, Local Connections Programme (divio-media.com) (PDF, 3.3MB)

The benefits of LDES are not just avoided carbon emission and increased renewable penetration: In their *Game Changer* report from 2022, Energy Storage Ireland and Baringa[4] found that energy storage can deliver a net saving of €85m per year to end customers in addition to reducing day-ahead emissions by 50% and curtailment by 100%.

The most recent development in Ireland's LDES space, EirGrid and SONI, the island of Ireland's two Transmission System Operators (TSOs) published *A Call for Evidence on the Market Procurement Options for Long Duration Energy Storage* (LDES) on 27 October 2023[5].

In the Call for Evidence, EirGrid and SONI highlight some of the benefits LDES can present to Ireland. The most notable ones are:

Results (All Ireland)	No New Incremental Storage	With New Incremental Storage
RES-E	c. 84%	c. 89%
Carbon Emissions	4.9 MtCO2e	3.35 MtCO2e
Dispatch Down Levels.	c. 3.5%	c. 27%
All Ireland Gen Cost	€1.1265 billion	€0.754 billion

In summary the *Game Changer* report from 2022[6] summaries the benefits that LDES can bring to the energy system of Ireland and to consumers by 2030:

- By participating in the Irish day-ahead energy market, energy storage can reduce day-ahead carbon emissions by 50% by using long-duration storage technologies. This makes a material contribution to meeting ambitious 2030 power sector decarbonisation goals.
- Strategic deployment of energy storage in transmission constrained regions of the network reduces the dispatch-down of renewable generation from constraints without the need for network reinforcement, unlocking additional carbon savings.
- By contributing to security of supply, helping to support renewable capacity, and displacing fossil fuels in the balancing market, energy storage can deliver a net saving to end consumers in Ireland of up to €85m per year.
- These benefits are additional to the carbon, renewable curtailment, and end consumer savings offered by energy storage through the provision of zero-carbon system services.
- Energy storage helps the integration of renewables at all stages by ensuring that generation is not wasted; reducing oversupply by up to 60%, constraint volumes by up to 90%, and curtailment by 100%.

In July 2024 The Government Published its Electricity Storage Policy Framework[7]. The framework outlines that grid scale electricity storage is vital in securing an electricity grid capable of exploiting the opportunities provided

[4] GameChanger-ESI-Report-May2022-Web-1.pdf (energystorageireland.com) (PDF, 3.5MB)
[5] LDES-Call-for-Evidence-SONI.pdf (PDF, 612KB)
[6] GameChanger-ESI-Report-May2022-Web-1.pdf (energystorageireland.com) (PDF, 3.5MB)
[7] https://www.gov.ie/en/publication/90a72-electricity-storage-policy-framework/

by the fast pace of Ireland's renewable generation programme and supporting the future growth of Irelands industrial sectors.

The policy framework is a first of kind policy, which clarifies the key role of electricity storage in Ireland's transition to an electricity-led system, supporting Irelands 2030 climate targets, it may be considered as a stepping stone on Ireland's path to net zero carbon emissions.

The Electricity Storage Policy Framework refers, in the main, to front of meter electricity storage, outlining its present roles, technical processes, market positions and regulatory structures in Ireland. The framework addresses the grids immediate and near-term needs by supporting the incorporation of electricity storage from the immediate up until 2040 and presents 10 government actions to support the role of electricity storage systems in Ireland's energy transition, identifying the key stakeholders and timelines for these actions.

The 10 no. government actions will support and facilitate the following Climate Action Plan 2024 and Sectoral Emissions targets:

- Increasing the penetration of Renewable Energy Sources (RES) in our Electricity (-E) sector to 80% by 2030.
- Supporting a target of 9GW of onshore wind generation by 2030.
- Supporting a target of 8GW solar generation by 2030.
- Supporting at least 5GW of offshore wind by 2030.
- Supporting 20-30% of demand side flexibility available to the system by 2030.
- Maximising the level of incorporation of renewably generated electricity to the grid network {Referred to as System Non-Synchronous Penetration - SNSP} by 2030 to 95%.
- Limiting Dispatch Down {excluding surplus generation} of renewables below 7%.
- Limiting sectoral carbon emission for the electricity sector for the periods 2021-2025 to the budget of 40 MtCO2eq and reducing this by a further 20 MTCO2eq for the second budgeting period 2026-2030

Electricity storage systems will maximise the incorporation of available renewable electricity across the grid system, further decarbonising our electricity system, reducing our dependence on fossil fuel generation and improving the overall operation of the electricity network through the provision of Targeted Demand flexibility, Strategic Grid Build Out and System services.

The Targeted Demand flexibility provided by electricity storage systems is vital to maximising the incorporation of renewable generation while maintaining a secure electricity supply, as it allows for the re-allocation of dispatchable renewable electricity through time by storing renewable electricity at times of surplus supply and exporting it back into the grid when required to meet customer demand and system needs.

The System services provided by electricity storage systems improve the overall operation and reliability of the network and facilitate the efficient integration of renewably generated electricity through a variety of processes (covered in Chapter 2), making electricity storage systems vital assets in supporting the effective functioning of the network and achieving our CAP targets for electricity.

The Strategic Grid Build Out provided by electricity storage systems is vital to the reinforcement of the grid. Renewable energy development projects can place strain on the System Operator's capacity to deliver an uninterrupted service. To that end, the incorporation of strategically located electricity storage systems will reduce this disruption and alleviate potential grid issues caused by upgrading infrastructure projects. It is the comparative ease and cost, with which electricity storage systems can be integrated to reinforce a regional or local grid network constraint that makes electricity storage systems particularly useful in the immediate management of local network grid build-out.

Therefore, in parallel with the European Union's Renewable Energy Directive (RED III), Electricity Market Design (EMD) and other EU Frameworks, Directives and Regulations regarding the deployment of renewable energy resources within the grid system and markets (further details may be found in the other parts of Chapter 3 below), this policy framework while recognising the independent roles of both the System Operators and the Regulatory authority, welcomes and supports the immediate incorporation of locational specific demand flexibility products and electricity storage systems to address identified system needs on both the distribution and transmission systems. Further, this policy framework includes actions to identify and incorporate the optimum amount of electricity storage to meet Ireland's near-term (2030- 2040) requirements.

3.2 Planning Policy

The need of the development is specifically linked to European and National Energy Policy. This Section of the Planning and Environmental Report assesses the energy and planning policy support for LDES.

This section should be read in conjunction with the enclosed Planning Statement which is submitted with the planning application. The Planning Statement provides an in depth analysis of the Projects consistency with the Donegal County Council County 2024 – 2030.

Energy storage will play a significant role in facilitating higher levels of renewable generation on the power system and in helping to achieve national carbon emission reduction targets. Storage systems can act in the energy, capacity, and system services markets to deliver a wide range of benefits such as wholesale energy price reductions, reduced CO2 emissions and flexible system support services to help manage the grid with higher levels of renewables. Energy storage can also make a significant contribution to security of supply, replacing the need for fossil fuel generation which is a key objective of European and National Energy policy.

3.2.1 European Policy

European policy and legislation have a significant impact on Irish Energy and Planning Policy and how Planning Authorities should have regard to National Climate and Energy Policy in the context of assessing energy storage projects pursuant to Section 34(2) of the Planning & Development Act 2000 (as amended).

Internationally, there is widespread acknowledgement of the imperative need for measures to alleviate the effects of climate change. The European Green Deal[8] was launched in 2020 and represents a comprehensive array of policy initiatives to enable the EU to achieve climate neutrality by 2050. It introduces a revised goal of at least a 50% reduction in the EU's greenhouse gas emissions by 2030, potentially reaching 55% compared to 1990 levels, thereby superseding the current target of 40% reduction. This signifies a significant escalation in ambition and will heavily rely on a fundamental transformation of the energy sector. Consequently, the EU must advocate for a substantial upsurge in the renewable energy sector in the upcoming decades. The Green Deal outlines specific objectives to curtail carbon emissions and improve practices related to forestry, agriculture, sustainable transportation, recycling, and renewable energy sources. Moreover, the action plan entails the potential implementation of carbon tariffs for nations that fail to restrain their greenhouse gas emissions.

Energy storage plays an important role in the European Green Deal and the Fit for 55 green transition package9, which includes a set of policy initiatives aimed at ensuring the EU gradually becomes climate neutral. The Green Deal envisages that the regulatory framework should *"foster the deployment of innovative technologies with energy storage".*

Council Regulation 2022/2577[10] represents an obligation on EU Member States to accelerate renewable energy projects and related grid and storage assets such as this Project as a matter of urgency in the interest of energy security , the deployment of which is viewed as vitally important to the achievement of the EU's strategic objectives. As per Article 10 of the Regulations, the Regulation is *"binding in its entirety and directly applicable in all Member States".*

Significantly, the Regulation incorporates and makes clear that *"installations for the production of energy from renewable sources, and their connection to the grid, the related grid itself and storage assets"* enjoy a rebuttable presumption that they are of overriding public interest and serving public health and safety, in particular, for the purposes of the relevant Union environmental legislation, except where there is clear evidence that these projects have major adverse effects on the environment which cannot be mitigated or compensated for.

The Regulation's make it clear that the planning authority must take as its starting assumption that the proposed LDES is of overriding public interest and contributes to public health and safety. Although the planning authority, retains discretion, the threshold for refusal of a grant of planning permission is, therefore extremely high.

The Fit for 55 Package[11] included a Commission proposal to revise the *Renewable Energy Directive (EU) 2018/2001.* This proposal was further updated in May 2022 as Part of the *REPower EU Plan*, subsequently endorsed by EU ambassadors (COREPER) on September 27th, 2023[12], and came into force in November 2023.

RED II[13] set a binding overall Union target to reach a share of at least 32% of energy from renewable sources in the Union's gross final consumption of energy by 2030. The text that has been adopted by the European Parliament and endorsed by COREPER increases this target to 42.5 %. This target is now captured in RED III[14].

[8] https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en
[9] https://ec.europa.eu/commission/presscorner/detail/en/IP_23_4754
[10] https://eur-lex.europa.eu/eli/reg/2022/2577/oj
[11] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021PC0557
[12] https://www.europarl.europa.eu/doceo/document/TA-9-2023-0303_EN.html
[13] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018L2001
[14] Directive - EU - 2023/2413 - EN - Renewable Energy Directive - EUR-Lex (europa.eu)

Additionally, the Directive obliges EU Member States to "collectively endeavour to increase the share of energy from renewable sources in the Union's gross final consumption of energy in 2030 to 45 %"15

The associated recital (Recital 5) included in the final agreed text provides useful context:

> *"The REPowerEU Plan set out in the Commission communication of 18 May 2022 (the 'REPowerEU Plan') aims to make the Union independent from Russian fossil fuels well before 2030. That communication provides for the front-loading of wind and solar energy, increasing the average deployment rate of such energy as well as for additional renewable energy capacity by 2030 to accommodate the higher production of renewable fuels of non-biological origin…. In that context, it is appropriate to increase the overall Union renewable energy target to 42,5% in order to significantly accelerate the current pace of deployment of renewable energy, thereby accelerating the phase-out of the Union's dependence on Russian fossil fuels by increasing the availability of affordable, secure and sustainable energy in the Union. Beyond that mandatory level, Member States should endeavour to collectively achieve an overall Union renewable energy target of 45 % in line with the REPowerEU Plan."*

This indicates a significant increase in the mandatory targets for renewable energy in the EU, aiming for a more sustainable and independent energy system, with signals of further increasing ambition through the 45% stretch target. This increased ambition for renewable energy at an EU level must be accommodated and addressed in member states Climate Action Plans.

Article 11 of the Directive clearly sets out that:

> *"Member States should therefore ensure that the deployment of renewable electricity continues to increase at an adequate pace to meet growing demand. To that end, Member States should establish a framework that includes market-compatible mechanisms to tackle the remaining barriers to having secure and adequate electricity systems fit for a high level of renewable energy, as well as* ***storage facilities*** *fully integrated into the electricity system."*

The Directive came into force in November 2023 and Member States have a period of 18 months to implement it. While time for implementation has not expired, this Directive provides further clear policy support at European level, and it is appropriate the planning authority should apply and/or have regard to the same. The Directive is highly relevant for three reasons.

Firstly, it envisages and requires a step-change in terms of the immediacy and ambition for renewable energy development across the Member States, without which the Union's climate neutrality objective simply cannot be achieved.

Secondly, it identifies the social and environmental benefits of renewable energy development as noted in Recital 2:

> *"By reducing those greenhouse gas emissions, renewable energy can also contribute to tackling challenges related to the environment, such as the loss of biodiversity, and to reducing pollution" and which will help to achieve the aim to "protect, restore and improve the state of the environment by, inter alia, halting and reversing biodiversity loss" while bringing "broad socioeconomic benefits, creating new jobs and fostering local industries"*

[15] Article 3, paragraph 1.

Thirdly, the Directive recognises the need for the integration of energy from renewable sources into the transmission and distribution gird and the use of energy storage systems for integrated variable production of energy from renewable resources.

3.3 National Policy

Ireland is one of the most ''energy import-dependent'' countries in the European Union. For 2022, Ireland's import dependency was 81.6% (SEAI, 2023), and the SEAI estimates that the cost of all energy imports to Ireland was approximately €4.5 billion (in 2019). This makes Ireland particularly vulnerable to future energy crises and fluctuations given its location on the periphery of Europe. Therefore there are a number of National Energy Policies which seek to support the acceleration of renewable energy and its associated grid infrastructure so to ensure that renewable energy can be maximised on the national grid through the use of technologies such as energy storage.

3.3.1 Project Ireland 2040: National Planning Framework

Project Ireland 2040: The National Planning Framework (NPF) was published in February 2018[16]. The NPF sets out the high-level, strategic planning and development for the country over the next 20+ years, in order to ensure that growth is economically, socially and environmentally sustainable in line with population growth. The Framework sets out to guide public and private investment, to create and promote opportunities for people, and to protect and enhance the environment, through a single shared set of goals (National Strategic Outcomes (NSOs)).

The NPF identifies the role of renewable energy sources in our transition to a low-carbon energy future throughout the document. National Strategic Outcome 8 (NSO8) recognises the need to transition to a low-carbon and climate-resilient society through the provision of regular Renewable Electricity Support Scheme (RESS) auctions to deliver competitive levels of onshore wind and solar electricity generation, which indicatively could be up to 2.5 GW of grid-scale solar and up to 8 GW of onshore wind by 2030. The RESS will also support the delivery of up to 5 GW of additional offshore renewable electricity generation by 2030.

It is acknowledged within the NPF that:

> *"Rural areas have significantly contributed to the energy needs of the country and will continue to do so, having a strong role to play in securing a sustainable renewable energy supply. In planning Ireland's future energy landscape and in transitioning to a low carbon economy, the ability to diversify and adapt to new energy technologies is essential. Innovative and novel renewable solutions have been delivered in rural areas over the last number of years, particularly from solar, wind and biomass energy sources."*

National Policy Objective 47 (NPO 47) recognises that there is a requirement to *"strengthen all-island energy infrastructure and interconnection capacity, including distribution and transmission networks to enhance security of electricity supply"* and NSO 8 recognises that *"New energy systems and transmission grids will be necessary for a more distributed, more renewables focused energy generation system, harnessing both the considerable on-shore and off-shore potential from energy sources."*

[16] https://www.npf.ie/

On 10 July 2024, the Draft First Revision to the National Planning Framework was published. The Draft update includes NPO 71 which seeks to *"support the development and upgrading of national electricity grid infrastructure, including to support the delivery of renewable electricity generating development".* and NPO 75 seeks to distribute the renewable energy targets as set out in the Climate Action Plan 2024 to each Region.

In conclusion, the NPF is the relevant policy document for Ireland and provides a context for which LDES can help achieve a greater penetration of renewable energy into the national grid.

3.3.2 Project Ireland 2040: National Development Plan 2021 - 2030

The National Development Plan 2021-2030 (NDP) published in October 2021, in tandem with the NPF, sets out the government's over-arching investment strategy and budget for the period 2021-2030. The NDP provides a platform from which investment can be provided and strategized in terms of economic growth, development and sustainability needs. Section 3.7 of the plan sets out that the "reliability of electrical supplies will be strengthened through investment in the electricity transmission and distribution grid" and will be *"complemented by measures such as investment in energy storage".* Chapter 13 also recognises that *"Ensuring security of electricity supply will also require investment in grid infrastructure, interconnection and storage (such as batteries)."*

3.3.3 Climate Action Plans

The inaugural Climate Action Plan (hereafter referred to as CAP with pertaining year of publishing) was published in June 2019, on the basis of the government declaring a climate and biodiversity emergency. CAP19 lays out a framework for how Ireland will achieve its legally binding 2030 targets for carbon emissions. CAP21 provided a detailed plan for taking decisive action to achieve a 51% reduction in overall greenhouse gas emissions by 2030 and setting out a path to reach net-zero emissions by no later than 2050, as committed in the Programme for Government and set out in the Climate Act 2021. CAP23 was the second update to CAP19 and was the first to be prepared under the Climate Action and Low Carbon Development (Amendment) Act 2021, introducing economy-wide carbon budgets and sectoral emissions ceilings. At the time of writing CAP24 is the third and most recent update to CAP.

The government published the CAP19 in June 2019. CAP19 resulted from the government declaring a climate and biodiversity emergency on 9th May 2019. CAP19 identifies how Ireland will achieve its 2030 targets for carbon emissions throughout various sectors with a number of actions. A selection of these relevant to the proposed development is listed below.

CAP19 states that:

> *"The analysis presented in this Plan shows that it is not only technically feasible to meet our 2030 EU target, but that it is also economically achievable. The majority of the required abatement to 2030 could be achieved by deploying measures that are, over their lifetime, either cost-neutral or result in net savings to society."*

Key actions identified for electricity include:

- Increase reliance on renewables from 30% to 70% adding 12GW of renewable energy capacity (with peat and coal plants closing).
- Put in place a coherent support scheme for micro-generation with a price for selling power to the grid.

- Open up opportunity for community participation in renewable generation as well as community gain arrangements.
- Streamline the consent system, the connection arrangements, and the funding supports for the new technologies on and offshore.

Building on CAP 2019, CAP 2021 introduced the commitments to *"increase the proportion of renewable electricity to up to 80% by 2030".*

CAP21 identifies targets and timelines which each sector of the economy must meet to deliver the stated objectives of a reduction of greenhouse omissions of 51% by 2030. In relation to the electricity sector, CAP21 states:

> *"The proposed pathway includes a more rapid build-out of renewable generation capacity (wind and solar power generation technologies),* ***increased storage****, and the deployment of zero-emissions gas. The decarbonisation pathway for the electricity sector is challenging given the rapid growth in demand for power, as well as the need to ensure security of supply through the decarbonisation journey."*

CAP 2023 and the subsequent CAP 204 refined and updated the measures and actions required to deliver the carbon budgets and sectoral emissions ceilings. The Plan provides a roadmap for taking decisive action to halve Ireland's emissions by 2030 and reach net zero by no later than 2050, as committed to in the Climate Action and Low Carbon Development (Amendment) Act 2021.

Key to the delivery of the CAP 24 objectives and the new ambitious targets in Accelerating Renewable Electricity Generation are the following measures:

- Accelerate and increase the deployment of renewable energy to replace fossil fuels;
- Deliver a flexible system to support renewables and demand.
- Manage demand.
- Most fundamentally, significant investment is needed in the transmission and distribution systems to maximise the usage of renewable electricity and to reduce constraints and congestion on the system. System Operators and the CRU must ensure the timely investment in, and delivery of, the required electricity network infrastructure, including key priorities such as the North South Interconnector, to meet the targets set out in this, and subsequent, Climate Action Plans.
- Deliver a streamlined electricity generation grid connection policy and process, and remove barriers, where possible, for the installation of renewables and flexible technologies reducing the need to build new grid, including hybrid (wind/solar/storage) connections.

Measures Identified to Accelerate Flexibility on the electricity grid include the following to be delivered;

- Maximum level of renewables at any one time on the grid: 85%
- Dispatch down (excluding oversupply) of renewables below 7%. Minimise oversupply.
- Require long term storage (4 hour plus) in place.

The above is to be achieved by Action No EL/24/16 which seeks to "*Adopt Electricity Storage Framework"* and Action No. EL/24/24 which seeks to *"Create a route to market for medium and long duration storage facilities which can provide flexible demand".*

3.3.4 Energy Storage Policy Framework

As a direct requirement of European and National Energy Policy. Ireland adopted its first 'Electricity Storage Policy Framework' (ESPF) in July 2024. The policy framework is a first of kind policy, which clarifies the key role of electricity storage in Ireland's transition to an electricity-led system, supporting Irelands 2030 climate targets, it may be considered as a steppingstone on Ireland's path to net zero carbon emissions.

The Electricity Storage Policy Framework refers, in the main, to front of meter electricity storage, outlining its present roles, technical processes, market positions and regulatory structures in Ireland. The framework addresses the grids immediate and near-term needs by supporting the incorporation of electricity storage from the immediate up until 2040 and presents 10 government actions to support the role of electricity storage systems in Ireland's energy transition, identifying the key stakeholders and timelines for these actions. The key Government Actions include the following;

Policy Action 6: *"Support the immediate Procurement of Deman Flexibility products and of (long duration) electricity storage to meet specific network needs, in the Distribution and Transmission systems respectively."*

Policy Action 10: *"To ensure a route to market for the identified optimum (long duration) electricity storage requirements for 2030-2040 is in place before end of 2028".*

It is important to note that the procurement processes for both Demand Flexibility Products and for (long duration*) electricity storage are separate and additional to the electricity storage systems procured through the Capacity Renumeration Mechanism, the Renewable Electricity Support Scheme and the DS3 programme.

In October 2023 EirGrid published *'A Call for Evidence on the Market Procurements Option for Long Duration Energy Storage (LDES)'*. In the Call for Evidence (CfE) EirGrid define LDES as electricity storage systems with a capacity of 8+hours duration or above. This call for evidence stemmed from EirGrid's findings in *the Shaping Our Electricity Future* (SOEF) roadmap.

The SOEF findings identified electricity storage as a critical technology for the 2030 transition targets through its roles in reserve provision, increasing renewable penetration and congestion management.

The basis of the CfE was to develop a business case for LDES on the transmission system as well as identify the barriers to its incorporation, the service it may provide and explore potential options to provide revenue streams. The CfE analysed the needs case for storage as considered by EirGrid and presented various procurement plans to incorporate LDES onto the grid. The ESPF Action No. 6 fully supports Eirgrids plans in this area through seeking the procurement of up to 500MW of (long duration) electricity storage on to the transmission grid system.

The Framework is keen to point out that;

> *"The development process of an electricity storage system begins with an application for planning permission, at present a pre-requisite for the procurement of an electrical storage system contract for any of the System Operators' products. The Government is conscious that planning permission as a pre-requisite is a major hurdle in regard to the financial planning of projects and may delay a service provider's inclusion in a System Operator's product auctions and associated incentive schemes"*

Given the clear objectives and goals set out in the ESPF and to be in a position to achieve a route to market by 2028 it is imperative that the subject project planning application is submitted to Donegal County Council immediately.

3.4 Regional Policy

3.4.1 North & Western Spatial & Economic Strategy

The North & Western Regional Spatial & Economic Strategy (RSES) came into effect on 24th January 2020. The RSES sets out a strategy to implement the NPF at a regional level and covers the period from 2020-2032. The RSES provides the roadmap for effective regional development – it delivers a combination of response, design and innovation.

The RSES highlights the challenges the region will face with the changing climate and emphasises the importance of producing renewable energy to tackle climate change and provide energy security. It states that "The Northern and Western Regional Assembly needs to strategically prepare for locally based energy networks enabling locally produced electricity connection to the grid and flexible energy consumption." The RSES recognises that the region has a huge potential for growth of renewables renewable energy is identified as being vital to meet the predicted growth in demand and an emerging and important contributor to the economy and employment in the Region.

The RSES sets out a strategic vision which includes actions to mitigate against climate change. The RSES sets out that the provision of prudently managed infrastructure is key to delivering a connected, vibrant, inclusive, resilient and smart region that places environmental sustainability and quality-of-life values at the heart of our decisions.

Chapter 8 on Infrastructure- Enabling our Region points out that the RSES recognises that the West Region is particularly rich in renewable energy resources. These generation sources are dispersed across the region. Furthermore, developing the grid will enable the transmission system to safely accommodate more diverse power flows from surplus regional generation and also facilitate future growth in electricity demand. These developments will strengthen the network for all electricity users, and in doing so will improve the security and quality of supply. This is particularly important if the region is to attract high-technology industries that depend on a reliable, high-quality, electricity supply. There are a number of policies outlined in the RSES supportive of this proposal as outlined in Table 3-1 below:

Table 3-1: Regional Spatial and Economic Strategy Objectives

Policy	Description
4.16	The North Western Regional Assembly (NWRA) shall co-ordinate the identification of potential renewable energy sites of scale in collaboration with Local Authorities and other stakeholders within 3 years of the adoption of the RSES. The identification of such sites (which may extend to include energy storage solutions) will be based on numerous site selection criteria including environmental matters, and potential grid connections.
4.17	To position the region to avail of the emerging global market in renewable energy by: • Stimulating the development and deployment of the most advantageous renewable energy systems; • Supporting research and innovation; • Encouraging skills development and transferability; • Raising awareness and public understanding of renewable energy and encourage market opportunities for the renewable energy industry to promote the development and growth of renewable energy businesses; • Encourage the development of the transmission and distribution grids to facilitate the development of renewable energy projects and the effective utilisation of the energy

Policy	Description
	generated from renewable sources having regard to the future potential of the region over the lifetime of the Strategy and beyond;
4.18	Support the development of secure, reliable and safe supplies of renewable energy, to maximise their value, maintain the inward investment, support indigenous industry and create jobs.

The RSES also includes a range of policy objectives which support the development of Electrical Grid Network projects such as the Proposed Development. Objectives include the following:

Table 3-2: Regional Spatial and Economic Strategy Objectives

Objective	Description
RPO 8.1	The Assembly support the development of a safe, secure and reliable electricity network and the transition towards a low carbon economy centered on energy efficiency and the growth projects outlined and described in this strategy.
RPO 8.2	Support the reinforcement and strengthening of the electricity transmission network with particular reference to the regionally important projects.
RPO 8.3	The Assembly support the necessary integration of the transmission network requirements to allow linkages with renewable energy proposals at all levels to the electricity transmission grid in a sustainable and timely manner.
RPO 8.4	That reinforcements and new electricity transmission infrastructure are put in place and their provision is supported, to ensure the energy needs of future population and economic expansion within designated growth areas and across the region can be delivered in a sustainable and timely manner and that capacity is available at local and regional scale to meet future needs. Ensure that development minimises impacts on designated areas.
RPO 9.4	Create Resilient Places and Low-Carbon Infrastructure by: Managing Natural Resources through adhering to the principles of the circular economy, monitor air quality through the use of smart technologies, with the overall aim of improving air quality and to protect local ecosystems through the management of our natural capital Transitioning to a Low Carbon Economy through a presumption against development in areas vulnerable to flooding and rising sea levels, continuing to assess the probability of risk from all sources of flooding, and working with relevant stakeholders in both the assessment and delivery of any mitigation responses required; Furthermore, purse the generation of renewable energies and their local applications through, for example, green infrastructure planning, innovative design solutions, the promotion of energy-efficient buildings and homes Diversifying Energy Resources by promoting and facilitating the development of the wider North West region as a Centre of Excellence for renewable energy and innovation and establishing a sustainable energy strategy for the City Region that pursues continued investment in the resilience

Objective	Description
	and security of electricity networks and infrastructure, and the development of a diverse energy portfolio, harnesses the expertise of technological research and training among the region's institutions of higher education, growing the development of a skilled workforce in all aspects of energy generation including linking employment opportunities in the emerging renewable energy field to workers displaced from other economic sectors.

The development of the Proposed Development will aid in meeting the objectives set out in the RSES including diversification and strengthening of the electricity network, in working towards a low carbon economy with energy efficiency in meeting the energy needs of the future population.

The Proposed Development will aid in meeting the objectives set out in the RSES including diversification and strengthening of the electricity network, in working towards a low carbon economy with energy efficiency in meeting the energy needs of the future population.

The proposed development uses innovative technology which aids in strengthening the existing electrical network.

Policy	Description	Applicant's Response
RPO 4.16	The North Western Regional Assembly (NWRA) will co-ordinate the identification of renewable energy sites in collaboration with Local Authorities and stakeholders, considering energy storage solutions based on environmental matters and grid connections.	The NWRA work is within the infancy of its programme in relation to site selections, this site has been assessed from a technical and environmental perspective and is sited correctly relative to the need for the deployment of advanced energy storage systems, supports innovation, and helps foster the development of technical skills in energy storage and grid management.
RPO 4.17	Position the region for the global renewable energy market by stimulating renewable energy systems, supporting research and innovation, developing skills, and raising awareness of renewable energy's potential. Encourage grid development to support renewable energy projects.	The proposed project contributes to positioning the region for global leadership in renewable energy. The first of a kind project facilitates the deployment of advanced energy storage systems, supports innovation, and helps foster the development of technical skills in energy storage and grid management. Additionally, the project enhances grid infrastructure, enabling the efficient use of renewable energy and promoting long-term energy sustainability.

RPO 4.18	Support the development of secure, reliable, and safe renewable energy supplies to maximize value, maintain investment, and support indigenous industries and job creation.	The project enhances the reliability and security of renewable energy supplies by ensuring consistent energy availability even when renewable generation is variable. This supports ongoing investments in the region's renewable energy sector and creates job opportunities within the growing energy storage and renewable industries, bolstering local economic development.
RPO 8.1	The Assembly supports the development of a safe, secure, and reliable electricity network and the transition towards a low-carbon economy centered on energy efficiency and the growth projects outlined and described in this strategy.	The project supports the development of a reliable electricity network by providing long-duration storage, ensuring consistent energy availability even when renewable sources like wind and solar are intermittent. This contributes to energy security. Additionally, the project accelerates the transition to a low-carbon economy by enabling greater integration of renewable energy, reducing the reliance on fossil fuels, and improving overall energy efficiency through avoided curtailment. The growth in renewable energy projects aligns with the strategy for a sustainable, low-carbon future.
RPO 8.2	Support the reinforcement and strengthening of the electricity transmission network with particular reference to regionally important projects.	The facility will strengthen the regional grid by providing long-duration energy storage, supporting the transmission network, and ensuring that renewable energy generation is stored and dispatched when needed. This directly contributes to reinforcing the grid and enhancing regional resilience.
RPO 8.3	Support necessary integration of transmission network requirements to ensure sustainable linkages with renewable energy proposals.	The battery project ensures a seamless integration of renewable energy by storing excess renewable generation, which supports the transmission network's ability to maintain grid balance and provides a sustainable linkage between generation and demand. This aligns with grid requirements and renewable energy objectives.
RPO 8.4	Ensure new electricity transmission infrastructure is in place to meet future population and economic expansion needs in a sustainable way, with minimal impact on designated areas.	The iron-air battery will complement new transmission infrastructure by mitigating the need for extensive grid expansions. By storing renewable energy, it ensures a reliable power supply while minimizing environmental impacts on designated areas.

RPO 9.4	Create resilient places and low-carbon infrastructure through: a) Managing natural resources. b) Transitioning to a low-carbon economy. c) Diversifying energy resources.	a) The battery will manage natural resources by storing renewable energy, reducing reliance on fossil fuels, and improving air quality. b) It contributes to the low-carbon transition by enabling more renewable energy use and lowering emissions. c) By adding a new form of energy storage, it diversifies the region's energy mix, promoting resilience and supporting regional innovation in clean energy.

3.5 Local Policy

The County Donegal Development Plan 2024 - 2030 came into effect on 26 June 2024 and is the relevant Development Plan for the subject lands.

3.5.1 Donegal County Development Plan 2024-2030

County Donegal Development Plan (CDDP) 2024-2030 has climate as a core component. Chapter 4 of the County Donegal Development Plan 2024-2030 sets out the County's approach to climate change. The effects of climate change can be seen in the local context, through events such as the Letterkenny University Hospital flood (2013) and the Inishowen Peninsula Floods (2017). The Development Plan supports the achievement of national and international objectives for a net zero carbon emissions by 2050, by supporting developments that help mitigate climate change.

Chapter 9 of the County Donegal Development Plan on Natural Resource Development highlights that the Government has identified increased renewable energy generation as a key measure in the strategy to reduce greenhouse gas emissions and meet international obligations. Notably, one of the measures outlined in the 'Climate Action Plan, 2021' (DCCAE) is that 80% of the Country's electricity shall be generated from renewable sources. Furthermore, there are a number of policies and objectives that support diversifying the county's energy portfolio.

Relevant key objectives to facilitate this listed in Table 3-3, below.

Table 3-3: Key Objectives from Draft Donegal County Development Plan (2024-2030)

Objective	Description
E-O-1	To sustainably develop a diverse and secure renewable energy supply to meet demands and capitalize on the County's competitive locational advantage.
Applicant's Response	*The Proposed Development aims to improve the renewable energy supply by aiding the grid network.*
E-O-2	To secure the maximum potential from the wind energy resources of the County commensurate with the receiving environment and local developments patterns consistent with the proper planning and sustainable development, thereby contributing to the national drive towards ensuring the security of energy supply

Applicant's Response	*The Proposed Development will serve to maximise the potential from wind energy resources through the absorption of surplus power generated by these renewable energy sources when the grid can't transfer the power, the project can absorb the surplus and then at times of low wind output when the grid is less congested, the power is released back into the grid.*
E-O-3	To facilitate the strengthening of the electricity grid to a minimum rating of 220KV to enable the harnessing and distribution of energy.
Applicant's Response	*The Proposed Development will facilitate the strengthening of the electricity grid and support the penetration of renewable energy generation onto the national grid.*
E-O-4	To facilitate the sustainable development of Donegal as a Centre of Excellence for renewable technology, and Killybegs as an offshore service centre and renewable energy hub.
Applicant's Response	*The Proposed Development will contribute to the development of Donegal as a Centre of Excellence for Renewable Technology by introducing cutting edge sustainable technology improvements to the electricity network.*
S-O-4	To support the development and implementation of a sustainable economic model for County Donegal embracing growth in areas such as innovation, research and development, rural diversification, tourism initiatives, energy advances and the promotion of sustainable start up enterprises as an integral component of accelerating socio-economic growth throughout the County and in a Regional, Cross Border and National context.
Applicant's Response	*The Proposed Development will aid the growth of County Donegal through advancing the local energy system. Ensuring electricity security and stability is essential in facilitating further socio-economic development within the County and the region.*
ETN-O-1	To secure the strengthening of the electricity grid to include the provision of 220kv transmission networks to enable the harnessing and distribution of energy.
Applicant's Response	*The Proposed Development serves to strengthen the electricity grid.*
CS-O-5	To pursue opportunities for further investment in essential infrastructure.
Applicant's Response	*The Proposed Development falls under the category of essential infrastructure as it will aid the securing and stabilising of the electricity grid.*
ED-O-20	To progress the delivery of key strategic enabling infrastructure including roads, rail, broadband, gas, electricity, water and wastewater as identified in this plan in close collaboration with government departments, agencies and utilities operators in order to align the Core Strategy and the economic development objectives of this plan with the development and roll out of their respective investment programmes.
Applicant's Response	*The Proposed Development will deliver enabling electricity infrastructure.*

Relevant key policies to facilitate this listed in Table 3-4, below.

Table 3-4: Key Policies from Donegal County Development Plan (2024-2030)

Policy	Description
E-P-1	It is policy of the Council to facilitate the development of grid reinforcements including grid connections and transboundary energy network (electricity and gas) into and through the County, within the Region, and to support the development of cross border grid connections, subject to other objectives and policies of this Plan.
Applicant's Response	*The Proposed Development will serve as a grid reinforcement.*
E-P-2	It is a policy of the Council: I. to facilitate the appropriate development of renewable energy and energy storage projects arising from a variety of sources, including hydro power, ocean energy, hydrogen, bioenergy, biomass, solar, wind, district heating systems and geo-thermal and the storage of water as a renewable kinetic energy resource, in accordance with all relevant material considerations and the proper planning and sustainable development of the area; II. not to support the process of Hydraulic Fracturing (or fracking).
Applicant's Response	*The Proposed Development is a sustainable energy storage project.*
E-P-8	It is a policy of the Council to support and facilitate proposals for secure, appropriately scaled energy storage systems and infrastructure, including green hydrogen gas storage which supports energy efficiency and reusable energy systems, subject to other objectives and policies of this plan.
Applicant's Response	*The principle of the Proposed Development is directly supported under this policy as it supports energy efficiency and reusable energy systems through the energy storage system.*

Particularly noteworthy is General Policies **E-P-2 and E-P-8** in Chapter 9 - Natural Resource Development of the County Donegal Development Plan 2024-2030. This policy outlines the county's support for proposals for secure, appropriately scaled energy storage systems such as the Proposed Development.

As significant growth has taken place within the county, the lack of key enabling infrastructure including electricity, gas, rural broadband, water and wastewater is posing a challenge for the county. This is outlined in Chapter 7 - Economic Development of the CDDP 2024-2030, which states that Donegal County Council is committed to supporting the delivery of this critical infrastructure as a part of the Development Plan and beyond.

The DCCP 2024-2030 also acknowledges EirGrid's Strategy 2020-2025 'Transform the Power System for Future Generations', which sets out plans for an estimated 25% growth in electricity demand by 2025, along with a target of net zero carbon emissions by 2050.

The proposed development is for an appropriately scaled energy storage facility providing long duration energy storage and will help towards alleviating issues associated with much of the remaining onshore wind energy potential being located in the western and northwestern regions of the country where there is not currently adequate electrical infrastructure to handle increases in power capacity. Without a solution, this will inevitably result in wind farms being asked to reduce or stop (known as Dispatch Down) their output, thereby renewable energy which could have been produced and used by the Irish people will be lost. Therefore, extra renewable capacity in these regions will contribute less and less to the Climate Action Plan if measures are not taken. By its very nature, renewable sources such as wind and solar are intermittent. Lull periods can last hours or even days. Traditionally, fossil fuel electrical generators such as natural gas are scheduled/dispatched during these lull periods so that the electricity demand can be met. However, the use of fossil fuels contravenes the Climate Action Plan and can therefore no longer be relied on for this purpose as we move out to 2030.

Strategic deployment of energy storage in transmission constrained regions of the network reduces the dispatch-down of renewable generation from constraints without the need for network reinforcement, unlocking additional carbon savings.

By contributing to security of supply, helping to support renewable capacity, and displacing fossil fuels in the balancing market, energy storage can deliver a net saving to end consumers in Ireland of up to €85m per year.

These benefits are additional to the carbon, renewable curtailment, and end consumer savings offered by energy storage through the provision of zero-carbon system services.

Energy storage helps the integration of renewables at all stages by ensuring that generation is not wasted; reducing oversupply by up to 60%, constraint volumes by up to 90%, and curtailment by 100%.

The proposed development uses the 100hr Iron air technology. This is considered to be an appropriate development at this site due to:

- Scalability: Iron is one of the most globally abundant resources on earth and is mined on every continent. With Form bringing to the fold world-class collaborators such as Luxembourg based manufacturing company ArcelorMittal, Multi Day Storage (100Hr) production can catalyse the significant scale-up of low-carbon direct reduced iron, a key component of the Form battery. For context, of the 2.8 billion tonnes of metals mined globally in 2022, 2.6 billion tonnes were iron.
- Modularity / Locational Flexibility: MDS can be sited anywhere on the grid and at the highest value interconnection positions. Form's system design applies the same principles of low-cost, modular architecture used today in solar and lithium-ion deployments, making it easy to design the right sized solutions in the grid locations with greatest need.
- Safety: There is no risk of the thermal runaway mechanism common to lithium-ion batteries. The cells consist of electrodes and iron anodes submerged in a water-based, non-flammable electrolyte. There is no path for uncontrolled chain reactions that could lead to fire risk. The batteries also contain no heavy metals.
- Circularity: Iron forms the bulk of the battery by weight and can be recycled indefinitely. As such, iron-air technology offers significant end-of-life advantages, and can support Ireland's transition to a circular economy.
- Low-Cost Potential: The active components of Form's battery are some of the safest, cheapest, and most abundant materials on the planet — iron, water, and air. Iron-air is the lowest energy storage cost medium, with a chemistry entitlement cost of <$1/kWh. On a global scale, the turnkey installed system capital costs will be one-tenth that of lithium ion (<$20/kWh).

As evidenced by the AA Screening Report, EcIA, Photomontages and Planning Statement appended to this report, the proposed development is of an appropriate scale for the site, and is in a prime location to be of most benefit to the grid, to contribute to meeting national and global targets for decarbonisation of the grid. The proposed development is considered to be consistent withal relevant policies and objectives of the Development Plan, in particular Policies E-P-2 and E-P-8.

3.5.1 Local Authority Climate Action Plan (LACAP) 2024 - 2029

The recently released Climate Action Plan for County Donegal (2024-2029) contains an outline for how Donegal County Council (DCC) will take responsibility for enhancing climate resilience, increasing energy efficiency, and reducing greenhouse gas emissions within the County jurisdiction. This is necessary to ensure that the environmental, social, and economic benefits that come with climate action, can be fully realised.

The LACAP provides strategic direction for the DCC to:

- *actively translate national climate policy to local circumstances with the prioritisation and acceleration of evidence-based measures*
- *assist in the delivery of the climate neutrality objective at local and community levels; and*
- *identify and deliver Decarbonising Zone(s) (DZs) within the local authority area to act as test bed(s) for a range of climate mitigation, adaptation and biodiversity measures in a specifically defined area, through the identification of projects and outcomes that will assist in the delivery of the National Climate Objective*

Within the LACAP 2024-2029, Strategic Goal 3 deals with the built environment, and outlines the pathway to increase resilience to climate change; reduce greenhouse gas emissions; increase the use of renewable energy and improve energy efficiency throughout all buildings and infrastructure. Objective BE4 of the LACAP is to "*Support the delivery of renewable electricity generation and transmission infrastructure within the County*".

A set of Actions have further been ascribed to each Objectives within the LACAP, with Action Ref. BE 4.5 relating to Objective BE4 being: "*Advocate for the ongoing expansion and improvements to the electricity grid infrastructure within the County to support renewable generation and supply*". This action is set with a 5-year timeframe, and the Council's role is to advocate for the action.

Applicant's Response:

The Proposed Development is aligned with Objective BE4 of the DCC LACAP 2024-2029, particularly furthering Action Ref. BE 4.5 to "*Advocate for the ongoing expansion and improvements to the electricity grid infrastructure within the County to support renewable generation and supply*".

3.5.2 Donegal County Council Climate Adaption Strategy 2019 - 2024

The Donegal County Council Climate Adaption Strategy 2019-2024 outlines a five-step process for the adoption of climate-conscious strategy and infrastructure for the county. The five-step process is provided for within the Local Authority Adaption Strategy Development Guidelines. Within the Climate Adaption Strategy a few goals are of particular importance for the Proposed Development:

Action plan: Goal 1 - Critical Infrastructure and Buildings: No. 9: Planning for Resilient Energy Networks: 1. *Encourage and enhance cooperation and communication with energy and service providers to ensure that energy infrastructure and services are resilient to the impacts of climate change*

BE 4.5 *Advocate for the ongoing expansion and improvements to the electricity grid infrastructure within the County to support renewable generation and supply.*

The Climate Adaption Strategy also recognises the increasing issue of power outages due to weather related damage to the electricity network. The Strategy further outlines the opportunities for innovative and sustainable solutions to issues of this kind. The Proposed Development aims to increase the electricity security in the area through supporting the electricity network with the addition of the LDES.

3.6 Planning Policy Conclusion

European and national energy policy together with planning policies relating to renewable energy development has established a need for the proposed development, of which such European and national policy has subsequently been transposed into regional and local planning policy. From this it is clear that the proposed development will contribute positively to achieving the County Development Plan policies and objectives and it will assist in fulfilling national energy targets.

In conclusion, the proposed development is in accordance with the proper planning and sustainable development of the area.

Energy storage has gained significant traction in Ireland due to the advancements in technology, which now provide a competitive renewable technology for the Irish market. This advancement is demonstrated in national and local strategies, plans and guidelines which are widely supportive of renewable development.

The introduction of the proposed development into agricultural settings is considered to provide a suitable technology in diversifying the rural economy.

In setting out the development proposal, due consideration of the policies and objectives of the national planning policy framework and Donegal CPD have been considered in regard to the location, design and layout of the proposed LDES, including the overall scale of development.

A detailed appraisal of the potential impacts associated with the construction, operation and decommissioning phases of the proposed development has been carried out, and interventions have been included to eliminate, reduce or mitigate potential adverse impacts. These are set out in this planning and environmental report and accompanying documentation and reports. The proposed development is a first of its kind in Ireland and represents an opportunity to provide a forward-thinking approach to ensure that Ireland is proactive in meeting climate and renewable energy targets.

In summary, Fehily Timoney and Company consider that the proposed development accords with national, regional, and local planning policies and the CPD.

4. CONSULTATION

4.1 Consultation

There have been multiple consultations carried out as part of the preparation of this proposed LDES planning application. These are outlined below.

4.1.1 Public Consultation

The Applicant has carried out extensive public consultation as part of the preparation of the planning application. As part of this a Community Engagement Manager was appointed to introduce and communicate key project information to the project through direct and indirect engagement with the local community.

As part of this an information website for the project was made live, and in line with this a newsletter was distributed by the Community Engagement Manager to houses adjacent to the project area alongside an invitation to attend an Information Hub held on 8 February 2024.

A further newsletter was issued to houses adjacent to the project area in April 2024, this included an invitation to a Community Engagement Clinic, held on 25 April 2024.

Please see Table 4-1 below for a summary timeline of public consultation held in respect of the proposed development.

Table 4-1: Summary of Public Consultation Carried Out

Date	Community Engagement
29th January	Dedicated project website goes live.
29th/30th January	Newsletter 1 and introduction letter with an invitation to an Information Hub was distributed locally with direct engagement by CEM.
8th February	Info Hub evening held, 40+ people attended. Letters with questions were handed in.
14th February	Thank-you and acknowledgement letters posted to stakeholders that attended and provided their names and addresses at the Information Hub.
27th/28th March	Replies to questions received at Information Hub and an accompanying letter were distributed locally with direct engagement by CEM.
17th/18th April	Newsletter 2 and accompanying letter with an invitation to a community engagement clinic were hand-delivered with direct engagement by CEM. Advertorials were placed in the two local newspapers to promote the community engagement clinic.
25th April	Meeting, presentation and Q&A with Donegal County Council.
25th April	Community Engagement Clinic held. 28+ adults and 1 Councillor attended.

Date	Community Engagement
Week 6th May	Project update letter with notice of an on-site hydrology survey taking place during May/June was distributed locally.
Expected during August/September	Project "Notice to submit into planning" letter hand-delivered with direct engagement by CEM.
Expected during August/September	Project "Notice to Submit into planning" advertorials placed in local papers.
Expected during August/September	Project site notices erected and displayed.
Expected during August/September	Project planning application lodged to planning authority. Planning documents uploaded onto project website.
January to now	At the project launch, the Community Engagement Manager emailed/posted all nine local elected representatives in the municipal district of Inishowen, Co. Donegal, and the sitting Deputy representing the area, to inform them about the project. From that time onwards, local elected representees who requested to be kept informed were emailed/posted all project correspondence to include invitations to the Information Hub and community engagement clinic. This commitment will continue.

We also refer to the Community Engagement Report, prepared by the Applicant, which is enclosed in Appendix 6 of this report.

This provides a detailed breakdown of the public consultation held for the proposed development, as well as details of engagement with local elected representatives.

4.1.2 An Bord Pleanála Section 182A Consultation (SID)

A pre-application consultation submission was made to An Bord Pleanála on 26 February 2024 and dealt with under case number ABP-319157-24.

This was in order to determine whether the proposed Transformer Compound and under the fence connection to the existing Trillick 110 kV substation should be considered as Strategic Infrastructure Development in accordance with section 182A of the Act.

An Bord Pleanála determined that no pre-application meeting was required in respect of this request. The Board via letter dated 30 May 2024 determined that this element of the proposed development did not fall within the scope of Section 182A of the Act, and that a planning application should be made directly to Donegal County Council. A copy of this letter is enclosed in Appendix 5 of this report.

4.1.3 Pre-Planning Meeting Donegal County Council

Pre-planning consultation was requested from Donegal County Council on 8 March 2024, with a pre-planning meeting held on 25 April 2024 under Donegal County Council Reference PP7062.

A follow up written responses was provided by Donegal County Council via email on 17 June 2024. This included a number of matters for further consideration, as follows, note that FT responses to these items is shown below in ***bold italics***:

- Population and human health - ***Refer to Chapter 10 of this Report.***
- Biodiversity & Ecology - ***Refer to Chapter 8 of this Report as well as Appendix 7 (Ecological Impact Assessment) and Appendix 8 (Appropriate Assessment Screening Report).***
- Land, soil and geology - ***Refer to Chapter 6 of this Report.***
- Hydrology, flood risk, drainage - ***Refer to Chapter 7 of this Report.***
- Air quality and climate - ***Refer to Chapter 10 of this Report and Appendix 3 (Construction Environmental Management Report).***
- Archaeology - ***Refer to Chapter 12 of this Report and Appendix 9 (Cultural Heritage Impact Assessment Report).***
- Storage capacity of the facility - ***Refer to Chapter 2 of this Report and Appendix 1 (Technology and Compliance Overview and Appendix 4 (Planning Statement).***
- Environmental Designations - ***Refer to Chapter 8 of this Report and Appendix 8 (Appropriate Assessment Screening Report).***
- EIA screening report - ***Refer to Chapter 5 of this Report.***
- AA screening report – ***Refer to Appendix 8 (Appropriate Assessment Screening Report).***

All of the above points are addressed through this Planning and Environmental Report and the plans and particulars included with this application.

For a full response to comments made by Donegal County Council please refer to the Appendix 4 ‘Planning Statement’, prepared by Fehily Timoney and Company. This also provides a detailed rationale as to the site selection for this development, the nature of and need for the proposed development and a thorough response on the consistency of the proposed development with Global, European, National and Local Policy.

4.1.4 Donegal County Council Roads

A further Teams meeting was held with Mr Kevin Lake, Area Engineer, Donegal County Council, on Friday 28 June 2024. Discussion during this meeting related to the requirements from a roads engineering point of view for the project, including:

- Anticipated number of trips for construction stage.
- Maximum laden weights of loads.
- Requirement for swept path analysis for internal access tracks and junctions.
- Confirmation that proposed access points were acceptable.
- Discussion on possible haul routes and confirmation of which route would be acceptable.

Please refer to Chapter 9 of this Report and Appendix 3 Construction and Environmental Management Plan for full responses to these items.

5. EIA SCREENING

5.1 Introduction

The following Chapter of the Planning and Environmental Report reviews the proposed development against the requirements of the EIA Directive.

The requirements for EIA of various types of development are transposed into Irish legislation under the Planning and Development Act, 2000 (as amended), and the Planning and Development Regulations, 2001 (as amended).

5.2 EIA Project Types

5.2.1 Legislative Basis

The first test is to examine whether the project is a type that is prescribed in the EIA Directive, as transposed into Irish law via the Planning & Development Regulations 2001 (as amended) ('the Regulations'). If a project is not of a type that is included in the Regulations, then there is no statutory requirement for it to be the subject of an EIA.

The European Union Directive 2014/52/EU on the assessment of the effects of certain public and private projects on the environment, requires member states to ensure that a competent authority carries out an assessment of the environmental impacts of certain types of projects, as listed in the Directive, prior to development consent being given for the project.

The EIA Directive requires that:

> *"in order to ensure a high level of protection of the environment and human health, screening procedures and EIA assessments should take account of the impact of the whole project in question, including where relevant, its subsurface and underground, during the construction, operational and, where relevant demolition phases".*

The Requirements for the EIA of various types of development are transposed into Irish legislation under the Planning and Development Act, 2000 (as amended), and the Planning and Development Regulations, 2001 (as amended).

Schedule 5, Part 1 of the Planning Regulations includes a list of projects which are subject to EIA based on their type. Part 2 of the same schedule includes a list of projects which by reason of scale also fall into the EIA category for example, wind farms with more than 5 no. turbines or having a total output greater than 5 megawatts or waste handling facilities that handle in excess of 25,000 tonne of waste per annum all fall into Part 2. Schedule 5 also includes a section on extensions or changes to developments for example, any change or extension to existing projects which would result in the development being of a class listed in Schedule 5 or result in an increase in size greater than 25% or 50% of the appropriate thresholds would fall into Schedule 5 and thus require an EIA.

Schedule 5: Part 2 of the P&D Regulations also includes however a section relating to 'sub threshold' (discretionary) EIA:

> *"15. Any project listed in this Part which does not exceed a quantity, area or other limit specified in this Part in respect of the relevant class of development, but which would be likely to have significant effects on the environment, having regard to the criteria set out in Schedule 7."*

This is where any project listed in Schedule 5 Part 2 which does not exceed a quantity, area or other limit (e.g. waste facility handling 20,000 tonnes per year or two turbines having an output less than 5 megawatts), should be subject to EIA where the project would be likely to have significant effects on the environment, having regard to the criteria set out in Schedule 7 of the Regulations.

Below we review the LDES facility against the energy categories and potentially other relevant categories of development contained in Schedule 5 of the Planning & Development Regulations 2001.

It is important to re-iterate that if the project does not form a project or a category that is listed in Part 1 or 2 of Schedule 5 of the Planning and Development Regulations 2001, as amended, recent High Court decisions, Sweetman v an Bord Pleanála (IGP Solar) [2020] IEHC 39 confirms that EIA cannot be required for that project.

5.3 Project Categories

Category	Assessment.
Schedule 5 Part 2 3.(b) - *"Industrial installations for carrying gas, steam and hot water with a potential heat output of 300 megawatts or more, or transmission of electrical energy by overhead cables not included in Part 1 of this Schedule, where the voltage would be 200 kilovolts or more."*	The proposed development for a Long Duration Energy Storage facility does not fall into this category.
Schedule 5 Part 2 3.(h) - *"Installations for hydroelectric energy production with an output of 20 megawatts or more, or where the new or extended superficial area of water impounded would be 30 hectares or more, or where there would be a 30 per cent change in the maximum, minimum or mean flows in the main river channel."*	The proposed development for a Long Duration Energy Storage facility does not fall into this category.

Category	Assessment.
Schedule 5 Part 2 3.(i) - *"Installations for the harnessing of wind power for energy production (wind farms) with more than 5 turbines or having a total output greater than 5 megawatts."*	The proposed development for a Long Duration Energy Storage facility does not fall into this category.
Schedule 5 Part 2 1.(a) - *"Projects for the restructuring of rural land holdings, undertaken as part of a wider proposed development, and not as an agricultural activity that must comply with the European Communities (Environmental Impact Assessment) (Agriculture) Regulations 2011, where the length of field boundary to be removed is above 4 kilometres, or where re-contouring is above 5 hectares, or where the area of lands to be restructured by removal of field boundaries is above 50 hectares."*	This is not relevant to the proposed development as it does not propose to remove existing field boundaries or change the structure of any rural land holding. It is therefore concluded, if one were to screen the proposed development against the criteria set out in 'Planning and Development (Amendment) (No.2) Regulations 2023', the project is well below the thresholds identified below and therefore does not require mandatory EIA.
Schedule 5 Part 2 1.(d)(iii) - *"Deforestation for the purpose of conversion to another type of land use, where the area to be deforested would be greater than 10 hectares of natural woodlands or 70 hectares of conifer forest."*	Whilst the proposed development does include the removal of forestry, this is commercial conifer forestry and not natural woodlands trees, The quantum of conifer forestry to be removed is approximately 4.7 hectares which is considerably below the 70 hectares of conifer forestry which would warrant a mandatory EIAR.

Category	Assessment.
Schedule 5 Part 2 10.(dd) - *"All private roads which would exceed 2000 metres in length."* The development shall include c. 515m of new and upgraded access track. It is therefore below this threshold.	We note that recent decisions by An Bord Pleanála (An Bord Pleanála reference: PL26.247217) confirm that access tracks installed for the purpose of solar PV development do not fall within the definition of a road under the Roads Act 1993 and therefore do not qualify as subthreshold development: *"The purpose of the site track is primarily for the construction and maintenance of the development. Its purpose is not for the conveyance of people and vehicles per se except as necessary in connection with the maintenance and construction of the development."* A recent High Court decision (Kavanagh v ABP [2020] IEHC 259) found that: *"the 2014 Directive does not require an EIA to be carried out in respect of planning applications for the construction and operation of solar farms. It follows that, in as much as the State has not made such a requirement part of Irish law, there is no failure on the part of the State to give effect to the provisions of the 2014 Directive"* It is respectfully submitted that the access tracks in this case should be considered in the same context, I.E. that they are for the construction and maintenance of the development rather than for the conveyance of people and vehicles, notwithstanding that they are below the outlined threshold.

Based on the above the only category that is relevant to the project is Schedule 5 Part 2 1.(Category (d)(iii), which refers to:

"Deforestation for the purpose of conversion to another type of land use, where the area to be deforested would be greater than 10 hectares of natural woodlands or 70 hectares of conifer forest."

Deforestation Whilst the quantum of deforestation is significantly below the threshold, notwithstanding this the project falls into the EIAR category and should be considered for sub-threshold assessment pursuant to Category 15 of the Regulations and therefore below we carry carryout a Schedule 7 assessment of the development.

5.4 Sub-Threshold EIA Screening

The following criteria are laid down in Schedule 7 of the Planning and Development Regulations 2001 (as amended) for the purposes of assessing if a proposed development would or would not be likely to have significant effects on the environment.

These criteria have been updated in accordance with Annex III of the 2014 Directive 2014/52/EU:

1. Characteristics of proposed development

The characteristics of the proposed development, in particular:

a) the size and design of the whole of the proposed development,
b) cumulation with other existing development and/or development the subject of a consent for proposed development for the purposes of section 172(1A)(b) of the Act and/or development the subject of any development consent for the purposes of the Environmental Impact Assessment Directive by or under any other enactment,
c) the nature of any associated demolition works,
d) the use of natural resources, in particular land, soil, water and biodiversity,
e) the production of waste,
f) pollution and nuisances,
g) the risk of major accidents, and/or disasters which are relevant to the project concerned, including those caused by climate change, in accordance with scientific knowledge, and
h) the risks to human health (for example, due to water contamination or air pollution).

2. Location of projects

The environmental sensitivity of geographical areas likely to be affected by the proposed development, with particular regard to:

a) the existing and approved land use,
b) the relative abundance, availability, quality and regenerative capacity of natural resources (including soil, land, water and biodiversity) in the area and its underground,
c) the absorption capacity of the natural environment, paying particular attention to the following areas:
    a. wetlands, riparian areas, river mouths;
    b. coastal zones and the marine environment;
    c. mountain and forest areas;
    d. nature reserves and parks;
    e. areas classified or protected under legislation, including Natura 2000 areas designated pursuant to the Habitats Directive and the Birds Directive and;

f. areas in which there has already been a failure to meet the environmental quality standards laid down in legislation of the European Union and relevant to the project, or in which it is considered that there is such a failure;

g. densely populated areas;

h. landscapes and sites of historical, cultural or archaeological significance.

3. Type and characteristics of the potential impact

The likely significant effects on the environment of proposed development in relation to criteria set out under paragraphs 1 and 2, with regard to the impact of the project on the factors specified in paragraph (b)(i)(I) to (V) of the definition of 'environmental impact assessment report' in section 171A of the Act, taking into account:

a) the magnitude and spatial extent of the impact (for example geographical area and size of the affected population likely to be affected);

b) the nature of the impact;

c) the transboundary nature of the impact;

d) the intensity and complexity of the impact;

e) the probability of the impact;

f) the expected onset, duration, frequency and reversibility of the impact;

g) the cumulation of the impact with the impact of other existing and/or development the subject of a consent for proposed development for the purposes of section 172(1A)(b) of the Act and/or development the subject of any development consent for the purposes of the Environmental Impact Assessment Directive by or under any other enactment, and;

h) the possibility of effectively reducing the impact.

This assessment utilises the Screening Checklist as detailed in the European Commission Guidance on EIA Screening, June 2017, to screen the proposed project with regard to EIA requirements and this checklist encompasses the details required under Annex III of the EIA Directive and in Schedule 7 of the Planning and Development Regulations 2001 (as amended) any potential impacts are then assessed with regard to their characteristics.

In completing this screening assessment regard has also been had to EIA Screening Guidelines contained in the Office of the Planning Regulator's Practice Note PN02 Environmental Impact Assessment Screening.

Checklist Questions	Yes/No/Briefly describe	Is this likely to result in a significant impact? Yes/No/Why?
1. Will construction, operation, decommissioning, or demolition works of the Project involve actions that will cause physical changes in the locality (topography, land use, changes in waterbodies, etc.)?	Yes. The proposed development involves construction works, which include the felling of c. 4.7ha of coniferous forestry as well as ground works to ensure a level site for the proposed development. The site will change from forestry use to use for LDES. The project does not propose any changes to waterbodies or other established land-used in the area.	No. The Project is considered to assimilate into the receiving environment effectively and is not considered to significantly impact on the locality in this regard please refer to the Landscape and Visual Impact Assessment. The project is largely contained in commercial forestry, whilst it is proposed to fell 4.7 ha of this forestry 14ha of forestry will remain around the periphery of the site. Refer to the Ecological Impact Assessment (EcIA) and Sections 6 – 13 of this PER.
2. Will construction or the operation of the Project use natural resources such as land, water, materials or energy, especially any resources which are non-renewable or are in short supply?	Yes. The proposed development involves construction works, which by their nature will involve the use of fossil fuels for construction machinery including the felling of forestry. The Operation of the facility will utilize small volumes of water from a public supply. The Project will also result in the felling of c. 4.7ha of coniferous forestry. The battery cells themselves use iron instead of precious metals or heavy metals and as such do not use materials which are in short supply (refer to Section 2.1.2 of this report for additional information on the proposed battery technology).	No. Given the scale of development and the volumes of water to be utilised during construction and operation of the facility the project is not likely to result in a significant impact.

Checklist Questions	Yes/No/Briefly describe	Is this likely to result in a significant impact? Yes/No/Why?
	The project if permitted will however indirectly potentially reduce the use of fossil fuel by displacing allowing energy generated by wind turbines to be stored and used more efficiently.	
3. Will the Project involve the use, storage, transport, handling or production of substances or materials which could be harmful to human health, to the environment or raise concerns about actual or perceived risks to human health?	Yes. During commissioning, each battery cell is filled with a water-based, non-flammable electrolyte, similar to that found in primary alkaline batteries.	No. The impact is not considered to be significant as there is inherent redundancy built in the system design for electrolyte containment. The cell serves as the primary containment of the electrolyte. The battery enclosure acts as the secondary containment, with the base of the enclosure serving as a basin to retain electrolyte in event of a battery electrolyte leak and thus preventing such a leak from resulting in a release to the environment. In addition, Form's enclosures will include leak detection and monitoring, with associated faults and alarms from the Battery Management System that will send alerts to the Power Plant Controller and the Customers Supervisory Control and Data Acquisition (SCADA) system. Upon detecting a leak, the system will automatically cut off power and move the affected enclosure to a safe state. As needed, personnel will address any issues according to the site-specific emergency response plan. Refer to the enclosed Form Energy Iron-Air Multi-Day Storage System Technology & Compliance Overview for further details.
4. Will the Project produce solid wastes during construction or operation or decommissioning?	Yes, During construction phase there will be solid wastes produced. Refer to Table 4.1 of the CEMP for a breakdown of these.	No. Refer to the enclosed CEMP for details on how waste will be efficiently managed. During the decommissioning phase minimal solid waste will be produced due to access tracks and compounds being left in situ.

Checklist Questions	Yes/No/Briefly describe	Is this likely to result in a significant impact? Yes/No/Why?
	During the operation of the project no solid wastes will be generated. During the decommissioning phase minimal solid waste will be produced due to access tracks and compounds being left in situ.	
5. Will the Project release pollutants or any hazardous, toxic or noxious substances to air or lead to exceeding Ambient Air Quality standards in Directives 2008/50/EC and 2004/107/EC?	No The project will not release pollutants to air. A small amount of discharge water shall be produced by the onsite reverse osmosis water treatment system which will filter mains water before being circulated through the battery storage units. This water will be directed to the onsite surface water drainage system. Based on the expected volume of fresh water required to operate the system identified by the Client, the estimated volume of discharge water from the reverse osmosis treatment system is 0.8 litres per minute. This discharge water is considered to be free of contaminants and can be accommodated within the designed surface water drainage system.	No. Please refer to Section 7 of this PER Hydrology section in relation to the discharge of water. The Project discharge water is not likely result in significant impacts
6. Will the Project cause noise and vibration or the releasing of light, heat energy or electromagnetic radiation?	Yes. The Project will cause noise due to components of the battery containers when operational.	No. A Noise Impact Assessment has been prepared to determine if the operation of the project is likely to have a significant effect. In this regard please refer to Section

Checklist Questions	Yes/No/Briefly describe	Is this likely to result in a significant impact? Yes/No/Why?
	During the construction phase, noise and vibration will occur during hours of works. The project will not release lighting, heat energy or electromagnetic radiation.	9 of this PER which concludes that the project meets current best practice guidance with regard to noise limits. Construction works will be managed in accordance with the CEMP, which will limit noise disturbance.
7. Will the Project lead to risks of contamination of land or water from releases of pollutants onto the ground or into surface waters, groundwater, coastal waters or the sea?	No. Any oil or other materials which have the potential to pollute will be contained appropriately in the Temporary Construction Compound. The maintenance regime is carried out in accordance with best practice. Water outputted from the reverse osmosis process will be simply de-mineralised water and will not release pollutants. Refer to Appendix 1 Form Energy Iron-Air Multi-Day Storage System Technology & Compliance Overview, Appendix 3 CEMP, Appendix 8 Appropriate Assessment Screening and Appendix 7 EcIA.	No. This is not likely to result in a significant impact with normal best practice maintenance practices.

Checklist Questions	Yes/No/Briefly describe	Is this likely to result in a significant impact? Yes/No/Why?
8. Will there be any risk of accidents during construction or operation of the Project that could affect human health or the environment?	Yes. There is the potential for accidents to occur during construction and operational stage which could affect human health. During operational stage there is a low risk of an accident which could affect human health or the environment. As outlined in Section 6 of the PER there is a low risk of peat slippage on site. Refer to the CEMP, Form Energy Iron-Air Multi-Day Storage System Technology & Compliance Overview and Sections 6, 9 and 10 of the PER.	No. The impact is not considered to be significant due to the implementation of mitigation measures as outlined within Sections 6 – 13 of the PER, as well as the enclosed EcIA and CEMP.
9. Will the Project result in environmentally related social changes, for example, in demography, traditional lifestyles, employment?	No. This project is for a LDES facility, aside from some potential additional local employment in the local area during construction stage, there will be no changes to the demography, traditional lifestyles or employment in the area.	No, As there is no change it will not result in a significant impact.
10. Are there any other factors that should be considered such as consequential development which could lead to environmental impacts or the potential for cumulative impacts with other existing or planned activities in the locality?	Yes. The Project will connect to the Uisce Eireann network for water supply. This will involve works in the public road, to be carried out by Uisce Eireann. An assessment of existing and proposed	No. No significant impacts are considered to occur due to consequential development.

Checklist Questions	Yes/No/Briefly describe	Is this likely to result in a significant impact? Yes/No/Why?
	developments that could give rise to cumulative impacts has been carried out. There are a number of planning permissions for wind development across County Donegal, however, due to the distance between the sites, cumulative effects are not likely to occur. Therefore, in the context of screening for EIA, no cumulative effects are envisaged to occur which would give rise to the need for an environmental impact assessment of the proposed development. Refer to the individual 'Cumulative Impacts' Sections of Sections 6 – 13 of this PER.	

Checklist Questions	Yes/No/Briefly describe	Is this likely to result in a significant impact? Yes/No/Why?
11. Is the Project located within or close to any areas which are protected under international, EU or national or local legislation for their ecological, landscape, cultural or other value, which could be affected by the Project?	No. Pathway assessments have been undertaken with respect to landscape, culture heritage and ecology. These assessments are contained in Sections 13, 12 and 8 respectively for this PER, an Appropriate Assessment Screening Assessment has also been prepared and is enclosed with this application. The site is not close to, in or, functionally connected to any protected site under international, EU or national or local legislation. The site is not in or functionally connected to any protected site. The Appropriate Assessment Screening Report states that by assessing the pathways for effects and the sources for impacts, as well as considering the processes involved and the distance of separation from the Natura 2000 sites, there are no likely significant effects on the qualifying interests, special conservation interest or the conservation objectives of any designated European site.	No. Having regard to the findings of the Biodiversity Section (Section 8) EcIA, AA Screening, Cultural Heritage Assessment (Section 12), Landscape and Visual Impact Assessment (Section 13) and Appropriate Assessment Screening the project is not likely to result in a significant impact on protected sites in the area.

Checklist Questions	Yes/No/Briefly describe	Is this likely to result in a significant impact? Yes/No/Why?
12. Are there any other areas on or around the location that are important or sensitive for reasons of their ecology e.g., wetlands, watercourses or other waterbodies, the coastal zone, mountains, forests or woodlands, that could be affected by the Project	No. Please refer to the EcIA and Appropriate Assessment Screening Report which demonstrate that the project and its continued operations is not having a negative effect on important or sensitive ecological receptors in the area.	No. No significant effects are expected by the continued operation of the Project on sensitive ecological receptors in the area. Refer to the EcIA and Appropriate Assessment Screening Report. In particular the Appropriate Assessment Screening Report concludes: *"…given the scale and nature of the potential sources, there are no likely significant effects identified to any European sites. This process has considered potential effects which may arise during all phases of the proposed project. Through an assessment of the pathways for effects and an evaluation of the sources for impacts, taking account of the processes involved and the distance of separation from European sites, it has been evaluated that there are no likely significant effects on the qualifying interests, special conservation interest or the conservation objectives of any designated European site.*
13. Are there any areas on or around the location that are used by protected, important or sensitive species of fauna or flora e.g., for breeding, nesting, foraging, resting, overwintering, migration, which could be affected by the Project?	Yes. Woodcock have been identified as using the site during winter. Seven of red listed bird species were recorded within 2km of the site. Please refer to the enclosed EcIA for detail of the biodiversity of the site and impact of the Project on same.	Yes. Refer to the EcIA which concludes that: *"given the scale and nature of the potential sources, there are no likely significant effects identified to any European sites. However, there will be likely significant effects to woodcock, whereby construction generated noise and lighting is likely to temporarily disturb woodcock from foraging and roosting habitats. Mitigation has been prescribed for ecological features, and there will be no residual effects as a result. Mitigation has also been prescribed for badger, under a precautionary basis as it is uncertain if there will be significant effects to this species.*

Checklist Questions	Yes/No/Briefly describe	Is this likely to result in a significant impact? Yes/No/Why?
		Additionally, biodiversity enhancement measures have been provided, including the implementation of bird boxes and a wetland pond."
14. Are there any inland, coastal, marine or underground waters (or features of the marine environment) on or around the location that could be affected by the Project?	No. There are no karst features at the site and the site is removed from the coastal environs. The Mill River (IE_NW_39M020300) is in close proximity to the Project and is classified in the WFD water quality status as 'Poor' and 'At Risk'. The aquifer underlining the study area is Lough Swilly groundwater body (IEGBNI_NW_G_059) and is classified as in 'Good' status. The Risk classification of this aquifer is still under '"Not At Risk"'.	No. Given the absence of such Karst or coastal features no significant impact expected. Please refer to Section 7 of the PER which concludes that the Project will have a negligible effect on hydrology and water quality.
15. Are there any areas or features of high landscape or scenic value on or around the location which could be affected by the Project?	No. The County Development Plan has identified the site as being in an area of Moderate Scenic Value, the lowest designation in the current Donegal CDP. Please refer to Section 13 of this PER for further detail.	No. This Project is well screened and is not considered to give rise to any significant residual impacts. Instead, landscape impacts are not considered to exceed 'Moderate-slight' significance, even in the immediate context of the site and residual visual impacts are not considered to exceed 'Slight-imperceptible' significance. In the context of this development, it is considered that these moderate to low level residual impacts represent an acceptable impact on the receiving working transitional landscape. Please refer to Section of this PER for further detail.
16. Are there any routes or facilities on or around the location which are used by the public for access to recreation or other facilities, which could be affected by the Project?	No.	No.

Checklist Questions	Yes/No/Briefly describe	Is this likely to result in a significant impact? Yes/No/Why?
17. Are there any transport routes on or around the location that are susceptible to congestion or which cause environmental problems, which could be affected by the Project?	No. Refer to Section 9 of this PER which outlines the impact of the Project on the surrounding road network.	No. Refer to Section 9 of this PER which outlines the impact of the Project on the surrounding road network, stating: *" The construction of the Proposed Development will lead to additional construction traffic, including HGV's, during the construction phase. The construction programme will take place over approximately 12 months with the peak period for construction traffic occurring in month 2.* *By adopting the mitigation measures proposed above and through the implementation of an adequately designed TMP, it is envisaged that the negative impact construction related traffic will have on the local road network will be 'temporary' to 'short-term' in duration, and 'slight' in significance. "*
18. Is the Project in a location in which it is likely to be highly visible to many people?	No. The site is well screened by forestry and additional screening is proposed.	No. The proposed Project is not considered to give rise to any significant residual impacts. Instead, landscape impacts are not considered to exceed 'Moderate-slight' significance, even in the immediate context of the site and residual visual impacts are not considered to exceed 'Slight-imperceptible' significance. In the context of this development, it is considered that these moderate to low level residual impacts represent an acceptable impact on the receiving working transitional landscape. See Section 13 of this PER for further detail.
19. Are there any areas or features of closed or cultural importance on or around the location that could be affected by the Project?	No. Please refer to Section 12 Cultural Heritage and the appended Cultural Heritage Impact Assessment.	No. the Cultural Heritage Assessment caried out for the proposed Project concludes that the Project will not give rise to any direct or indirect negative impacts or

Checklist Questions	Yes/No/Briefly describe	Is this likely to result in a significant impact? Yes/No/Why?
		significance of effect on recorded/protected archaeological or architectural heritage sites.
20. Is the Project located in a previously undeveloped area where there will be a loss of greenfield land?	Yes. The Project is located on land used for coniferous forestry. There will be a loss of c. 4.7 Ha of forestry as part of the proposed development.	No. c. 14Ha of coniferous forestry will be retained, and as such there will not be a significant loss of available habitat.
21. Are there existing land uses within or around the location e.g., homes, gardens, other private property, industry, commerce, recreation, public open space, community facilities, agriculture, forestry, tourism, mining or quarrying that could be affected by the Project?	Yes. There are a number of residential and agricultural uses in proximity to the Project which could be affected by the Project.	No. The noise impact assessment as carried out in Section 11 of this PER demonstrates that the project is not likely to have a significant impact on nearby receptors.
22. Are there any plans for future land uses within or around the location that could be affected by the Project?	No. We are not aware of any plans or future land uses proposed within or around the project site. The project site is located in a remote rural area which contains forestry and agricultural uses as well as one off housing.	No.
23. Are there areas within or around the location which are densely populated or built-up, that could be affected by the Project?	No. The site is a rural area with a low population density.	No.
24. Are there any areas within or around the location which are occupied by sensitive land uses e.g., hospitals, schools, places of worship, community facilities, that could be affected by the Project?	No. The site is a rural area with a low population density.	No.

Checklist Questions	Yes/No/Briefly describe	Is this likely to result in a significant impact? Yes/No/Why?
25. Are there any areas within or around the location which contain important, high quality or scarce resources e.g., groundwater, surface waters, forestry, agriculture, fisheries, tourism, minerals, that could be Affected by the Project?	Yes. The Project site contains coniferous forestry, of which c. 4.7Ha is to be felled.	No. c. 14Ha of coniferous forestry will be retained, and as such there will not be a significant loss of available habitat.
26. Are there any areas within or around the location which are already subject to pollution or environmental damage e.g., where existing legal environmental standards are exceeded, that could be affected by the Project?	Yes. The Mill River (IE_NW_39M020300) is in close proximity to the Project and is classified in the EPAs WFD water quality status as 'Poor' and 'At Risk'. The aquifer underlining the study area is Lough Swilly groundwater body (IEGBNI_NW_G_059) and is classified as in 'Good' status. The Risk classification of this aquifer is still under '"Not At Risk"'.	No. Please refer to Section 7 of the PER which concludes that the Project will have a negligible effect on hydrology and water quality.
27. Is the Project location susceptible to earthquakes, subsidence, landslides, erosion, flooding or extreme or adverse climatic conditions e.g., temperature inversions, fogs, severe winds, which could cause the Project to present environmental problems?	No. The Project is located in a location not susceptible to earthquakes, subsidence, landslides, erosion, flooding or extreme or adverse climatic conditions which would cause the Project to present environmental problems. Refer to Section 7.7.2 of the PER which outlines the flood risk associated with the site, and to Section 6.3 of the PER regarding the receiving environment from a geology and hydrogeology point of view.	No. The site has been subjected to a soils and peat stability assessment and there are no risks identified in this regard, see Section 6.3.7 of the PER for further details. With mitigation measures, outlined in Section 6.5 of the PER, put in place during construction, operational and decommissioning stage the proposed development will have imperceptible significance on the land, soils, hydrogeology and geology.

5.5 Conclusion on EIA Requirement

This EIA screening assessment has been carried out in accordance with the Planning and Development Regulations 2001 (as amended) The report assessed the impact of the proposed project, in conjunction with committed developments in the surrounding area, and other viable scheduled projects within the proposed project area.

Based on all available information, and taking account of the scale, nature and location of the proposed project, it is our opinion that the preparation of an EIAR is not a mandatory requirement (under Part 1 or Part 2 of Schedule 5). The project is deemed a sub-threshold development; hence the potential for significant environmental effects arising as a result of the proposed project has been evaluated, in accordance with the requirements of Schedule 7A and Schedule 7.

Key findings are summarised as follows:

- Limited noise emissions may be generated during the operation; however, this is anticipated to be minimal in effect and will not likely cause a significant impact.
- The landscape visual assessment identified that there are no significant impacts to the landscape character of the area and is in keeping with the existing landscape character.
- There will be no significant impact on the receiving biodiversity surface water, groundwater or traffic environment.
- There will be no impact on recorded monuments or protected structures or historic features.
- Decommissioning will be undertaken in accordance with a Decommissioning Plan to be agreed with the planning authority - having regard to prevailing environmental conditions to ensure the use of best available recycling technology and techniques available at the time.

In summary, no significant adverse impacts to the receiving environment will arise as a result of the proposed project.

It is therefore submitted that sub-threshold EIA is not required for the project due to the project's limited impact on the receiving environment with respect to Schedule 7 of the Planning and Development Regulations 2001 (as amended), Annex II of the EIA Directive and the screening checklist provided in the EC guidance document for EIA Screening, as set out in this document.

6. LAND, SOILS, GEOLOGY AND HYDROGEOLOGY

6.1 Introduction

This section provides an assessment of the potential impacts of the proposed energy storage development on the land, soils, geology and hydrogeology (including peat stability) aspects of the receiving environment. This Section assesses the potential impacts of the development and associated infrastructure.

The objectives of the assessment are:

- Produce a baseline study of the existing land, soils, geology and hydrogeology within the development area;
- Identify likely positive and negative impacts of the proposed development on land, soil, geology and hydrogeology (including peat stability) during construction and operational phases of the development; and,
- Identify mitigation measures to avoid, remediate or reduce significant negative impacts.

6.1.1 Statement of Authority

Please refer to Section 1.2 of this report for relevant statement of authority.

6.1.2 Relevant Legislation

The ER is prepared in accordance with best practice and in cognisance of the European Union Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment (the 'EIA Directive') as amended by Directive 2014/52/EU.

The ER has also been prepared in accordance with the requirements of the following legislation:

- S.I. No. 349 of 1989, European Communities (Environmental Impact Assessment) Regulations, and subsequent Amendments (S.I. No. 84 of 1995, S.I. No. 352 of 1998, S.I. No. 93 of 1999, S.I. No. 450 of 2000 and S.I. No. 538 of 2001);
- The Planning and Development Acts, 2000 to 2009, The Planning and Development (Amendment) Act 2010, S.I. 600 of 2001 Planning and Development Regulations and subsequent amendments including, S.I. No. 364 of 2005 and S.I. 685 of 2006;
- S.I. No. 473 of 2011, European Union (Environmental Impact Assessment and Habitats) Regulations 2011;
- S.I. No. 584 of 2011, European Union (Environmental Impact Assessment and Habitats) (No. 2) Regulations 2011;
- S.I. No. 4 of the Heritage Act 1995.

6.1.3 Relevant Guidance

The Land, Soils & Geology section of the ER is carried out having regard where relevant to guidance contained in the following documents:

- Environmental Protection Agency (2022). Guidelines on the Information to be Contained in Environmental Impact Assessment Reports;

- Institute of Geologists Ireland (2013). Guidelines for Preparation of Soils, Geology & Hydrogeology Sections in Environmental Impact Statements;
- National Roads Authority (2008). Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes;
- Scottish Executive (2017). Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments, 2nd Edition.

In summary the methodology adopted for this assessment includes:

- Review of appropriate guidance and legislation;
- Characterisation of the receiving environment;
- Review of the proposed project;
- Assessment of potential effects;
- Identification of mitigation measures; and
- Assessment of residual impacts.

The assessment methodology and criteria are outlined below.

6.1.4 Impact Appraisal Methodology

As mentioned previously, the aim of this Section is to identify the impacts of the proposed energy storage development on the land, soils, geology and hydrogeology (including peat stability) of the proposed development. The assessment also identifies appropriate mitigation measures to minimise these impacts.

The following elements were examined to determine the potential impacts of the proposed development on the land, soils, geology and hydrogeology within the study area:

- Characterisation of the soils, geology and hydrogeology of the study area;
- Evaluation of the potential impacts of the Project.

The baseline geological conditions within the study area were determined following a desktop review of publicly available information including aerial photography and EPA and GSI online databases. This review was undertaken in October 2023. In addition to the desktop assessment, a site walkover including a peat probing survey was undertaken in November 2023 and ground investigation was carried out in January 2024. The site walkover, including a peat probing survey, was undertaken by Emily Archer a FT Senior Project Geotechnical Engineer and Alan Whelan a FT Project Engineer. Emily has an MSc. In Applied Environmental Geoscience and has worked in consultancy for over 6 years. Alan has a BEng. in Civil Engineering and has worked in consultancy for over 4 years. The resulting data from this site walkover and the ground investigation is discussed in Section 6.3.6.

Following the assessment of the existing environment, and where potential impacts were identified, mitigation measures are proposed and will be implemented to minimise impacts on the environment to acceptable levels of significance. The residual impact from the Project was then re-appraised considering the mitigation measures.

6.1.5 Evaluation Criteria

During each phase of the proposed development (construction, operation & decommissioning), several activities will take place on site, some of which will have the potential to cause impacts on the geological regime at the proposed site and the associated Land, Soils and Geology. These potential impacts are discussed throughout this Section. Mitigation measures where required are presented in Section 6.5.

6.1.5.1 Assessment of Magnitude and Significance of Impact on Soils, Geology and Hydrogeology

An impact rating has been developed for each of the phases of the Project based on the Institute for Geologists Ireland (IGI) "Guidance for the Preparation of Soils, Geology and Hydrogeology Sections of Environmental Impact Statements". In line with the IGI Guidance, the receiving environment (Geological Features) was first identified.

Using the rating criteria in Appendix C of the IGI Guidance, the importance of the geological and hydrogeological features are rated (and) followed by an estimation of the magnitude of the impacts on geological and hydrogeological features (and).

This determines the significance of the impact prior to application of mitigation measures as set out in .

Table 6-1: Criteria for Rating Site Importance of Geological Features (NRA, 2009)

Magnitude	Criteria	Typical Example
Very High	Attribute has a high quality, significance or value on a regional or national scale. Degree or extent of soil contamination is significant on a national or regional scale. Volume of peat and/or soft organic soil underlying the site is significant on a national or regional scale.	Geological feature on a regional or national scale (NHA); Large existing quarry or pit; Proven economically extractable mineral resource.
High	Attribute has a high quality, significance or value on a local scale. Degree or extent of soil contamination is significant on a local scale. Volume of peat and/or soft organic soil underlying the site is significant on a local scale.	Contaminated soil on site with previous heavy industrial usage; Large recent landfill site for mixed wastes; Geological feature of high value on a local scale (County Geological Site); Well drained and/or high fertility soils; Moderately sized existing quarry or pit; Marginally economic extractable mineral resource.
Medium	Attribute has a medium quality, significance or value on a local scale. Degree or extent of soil contamination is moderate on a local scale. Volume of peat and/or soft organic soil	Contaminated soil on site with previous light industrial usage; Small recent landfill site for mixed wastes; Moderately drained and/or moderate fertility soils;

Magnitude	Criteria	Typical Example
	underlying the site is moderate on a local scale.	Small existing quarry or pit; Sub- economic extractable mineral resource.
Low	Attribute has a low quality, significance or value on a local scale. Degree or extent of soil contamination is minor on a local scale. Volume of peat and/or soft organic soil underlying the site is small on a local scale.	Large historical and/or recent site for construction and demolition wastes; Small historical and/or recent landfill site for construction and demolition wastes; Poorly drained and/or low fertility soils; Uneconomic extractable mineral resource.

Table 6-2: Criteria for Rating Site Importance of Hydrogeological Features (NRA, 2009)

Importance	Criteria	Typical Example
Extremely High	Attribute has a high quality or value on an international scale.	Groundwater supports river, wetland or surface water body ecosystem protected by EU legislation e.g. SAC or SPA status
Very High	Attribute has a high quality or value on a regional or national scale.	Regionally Important Aquifer with multiple wellfields. Groundwater supports river, wetland or surface water body ecosystem protected by national legislation – e.g. NHA status. Regionally important potable water source supplying >2500 homes Inner source protection area for regionally important water source.
High	Attribute has a high quality or value on a local scale.	Regionally Important Aquifer. Groundwater provides large proportion of baseflow to local rivers. Locally important potable water source supplying >1000 homes. Outer source protection area for regionally important water source. Inner source protection area for locally important water source.
Medium	Attribute has a medium quality or value on a local scale.	Locally Important Aquifer Potable water source supplying >50 homes. Outer source protection area for locally important water source.
Low	Attribute has a low quality or value on a local scale.	Poor Bedrock Aquifer. Potable water source supplying <50 homes.

Table 6-3: Estimation of Magnitude of Impact on Geological Features (NRA, 2009)

Magnitude	Criteria	Typical Example
Large Adverse	Results in loss of attribute	Loss of high proportion of future quarry or pit reserves Irreversible loss of high proportion of local high fertility soils Removal of entirety of geological heritage feature Requirement to excavate / remediate entire waste site Requirement to excavate and replace high proportion of peat, organic soils and/or soft mineral soils beneath alignment
Moderate Adverse	Results in impact on integrity of attribute or loss of part of attribute	Loss of moderate proportion of future quarry or pit reserves Removal of part of geological heritage feature Irreversible loss of moderate proportion of local high fertility soils Requirement to excavate / remediate significant proportion of waste site Requirement to excavate and replace moderate proportion of peat, organic soils and/or soft mineral soils beneath alignment
Small Adverse	Results in minor impact on integrity of attribute or loss of small part of attribute	Loss of small proportion of future quarry or pit reserves Removal of small part of geological heritage feature Irreversible loss of small proportion of local high fertility soils and/or high proportion of local low fertility soils Requirement to excavate / remediate small proportion of waste site Requirement to excavate and replace small proportion of peat, organic soils and/or soft mineral soils beneath alignment
Negligible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity	No measurable changes in attributes
Minor Beneficial	Results in minor improvement of attribute quality	Minor enhancement of geological heritage feature
Moderate Beneficial	Results in moderate improvement of attribute quality	Moderate enhancement of geological heritage feature
Major Beneficial	Results in major improvement of attribute quality	Major enhancement of geological heritage feature

Table 6-4: Estimation of Magnitude of Impact on Hydrogeological Features (NRA, 2009)

Magnitude	Criteria	Typical Example
Large Adverse	Results in loss of attribute and /or quality and integrity of attribute	Removal of large proportion of aquifer. Changes to aquifer or unsaturated zone resulting in extensive change to existing water supply springs and wells, river baseflow or ecosystems. Potential high risk of pollution to groundwater from routine run-off. Calculated risk of serious pollution incident >2% annually.
Moderate Adverse	Results in impact on integrity of attribute or loss of part of attribute	Removal of moderate proportion of aquifer. Changes to aquifer or unsaturated zone resulting in moderate change to existing water supply springs and wells, river baseflow or ecosystems. Potential medium risk of pollution to groundwater from routine run-off. Calculated risk of serious pollution incident >1% annually.
Small Adverse	Results in minor impact on integrity of attribute or loss of small part of attribute	Removal of small proportion of aquifer. Changes to aquifer or unsaturated zone resulting in minor change to water supply springs and wells, river baseflow or ecosystems. Potential low risk of pollution to groundwater from routine run-off. Calculated risk of serious pollution incident >0.5% annually.
Negligible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity	Calculated risk of serious pollution incident <0.5% annually.

The matrix in determines the significance of the impacts based on the importance and magnitude of the impacts as determined by to .

Table 6-5: Ratings of Significance of Impacts for Geology/Hydrogeology (NRA, 2009)

Importance of Attribute	Magnitude of Impact			
	Negligible	Small Adverse	Moderate Adverse	Large Adverse
Very High	Imperceptible	Significant/Moderate	Profound/Significant	Profound
High	Imperceptible	Moderate/Slight	Significant/Moderate	Profound/Significant
Medium	Imperceptible	Slight	Moderate	Significant
Low	Imperceptible	Imperceptible	Slight	Slight/Moderate

6.1.6 Desk Study

A desk study of the site and the surrounding area was completed in advance of undertaking the walkover surveys. This involved collecting all relevant geological, soils and peat stability data for the area. This included a review of the following resources:

- Environmental Protection Agency database (www.epa.ie);
- Geological Survey of Ireland, GSI (2006). Landslides in Ireland. Geological Survey of Ireland -Irish Landslides Group. July 2006;
- Geological Survey of Ireland, GSI (2024). Online dataset public viewer http://spatial.dcenr.gov.ie/imf/imf.jsp?site=GSI;
    - Quaternary subsoil geology;
    - 100k bedrock geology;
    - Karst features;
    - Geological heritage features;
    - Landslide susceptibility;
    - Catchment & Management Units;
    - Groundwater Bodies Status and Risk;
    - Drinking Water Protection Areas;
    - Groundwater Resources (Aquifers);
    - Groundwater Vulnerability; and
- Ordnance Survey of Ireland (1994). Discovery Series Map no. 23. Scale 1: 50,000.

6.1.7 Site Walkover and Field Assessments

The purpose of site walkover and field assessments was to determine the baseline characteristics of the site and to assess the site for any indications of slope instability.

The assessment works undertaken comprised the following:

- Walkover inspections of the site including recording of salient geomorphological features; and
- Peat depth probing and slope stability assessment in a grid across the entire Site. Shear strengths were taken at regular intervals across the site where there was deeper peat encountered.
- Recording of GPS co-ordinates of site investigation locations using a hand-held GPS.

Intrusive ground investigations were undertaken in January 2024 and were logged and supervised by a Geotechnical Engineer working for FT. These included 6 no. trial pits across the Site, as shown in Figure 6.1 below.

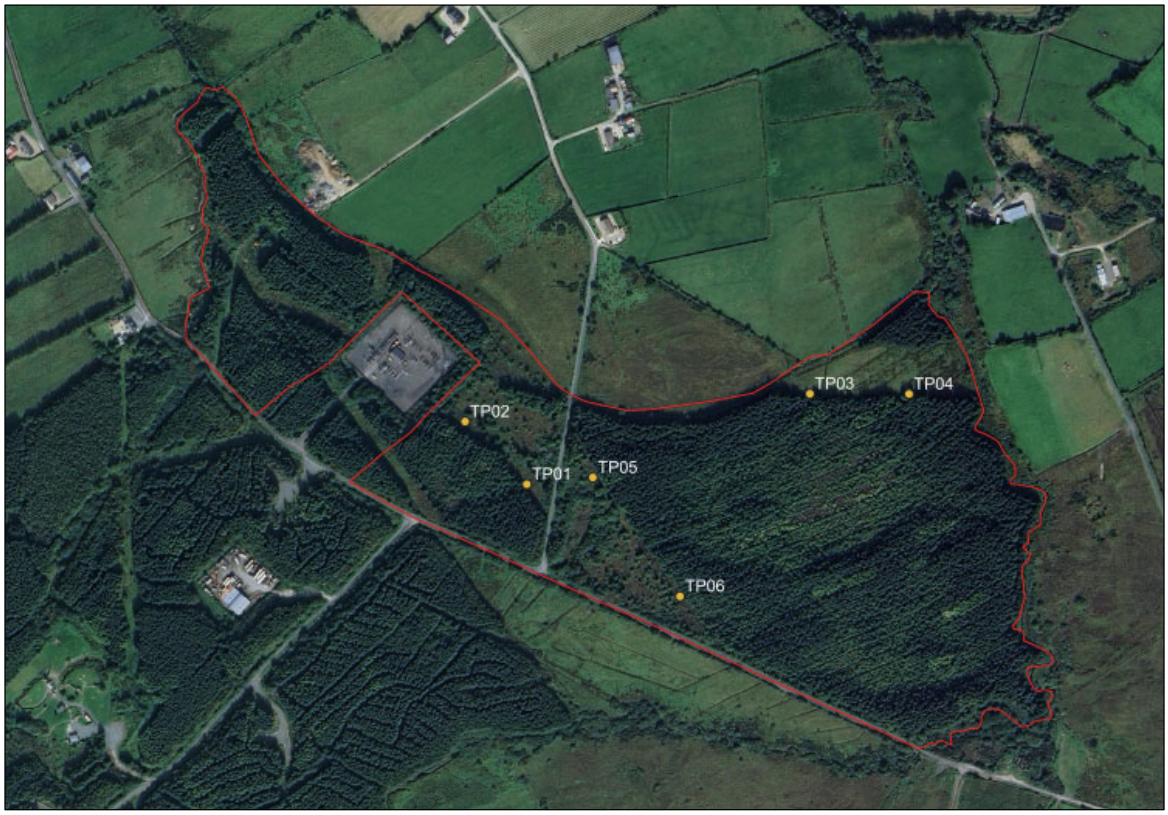

Figure 6-1: Trial Pit Locations

6.2 Receiving Environment

The receiving environment is described hereunder. This section also includes a summary of site-specific information obtained during site walkovers and intrusive site investigations undertaken as part of the baseline assessment works.

6.2.1 Quaternary Geology

The subsoils present within the development site and wider study area were taken from the Geological Survey of Ireland (GSI) online mapping - Quaternary Geology of Ireland (1:50,000 scale) and comprise:

- Blanket peat (BktPt).

During the site walkover and ground investigations it was found that the peat depth across the site ranges from 0.1m to 1m in depth with an average depth of 0.4m. The peat depth across the site is predominantly less than 0.5m with some localised areas in the north-east where the depth reaches 1m and in the west of the site where the depth reaches 0.9m. The peat probing and ground investigation indicate that the majority of the site is underlain by very shallow peaty soils (<0.5m in thickness) with shallow slopes (<5 degrees) and therefore peat stability is not considered to be an issue for such soils. There is no evidence of peat instability or erosion within the site, and degradation of the peat in the future is not anticipated.

6.2.2 Bedrock Geology

The Geological Survey of Ireland (GSI) 1:100,000 scale bedrock geology map shows that the Site is underlain by the Fahan Grit Formation. This formation is described as comprising pale grey grit with psammatic schist rock.

During the ground investigations refusal was met at 1.6m in TP01 and 4.2m in TP02, indicating rock. The ground investigation logs are presented in Appendix 11.

6.2.3 Hydrogeology

6.2.3.1 Aquifer Classification

The site area is underlain by a 'Poor Aquifer – Bedrock which is generally unproductive except for local zones'. The site is contained within the Lough Swilly groundwater body.

Table 6-6 presents a summary of the aquifer classification and characteristics underlying the study areas.

Table 6-6: Summary of Aquifer Classification and Characteristics

Aquifer Name	Groundwater Body (GWB)	GSI Aquifer Classification	Transmissivity (m2/day)	Well Yields	Location
Unknown	Lough Swilly	Poor Aquifer – Bedrock which is generally unproductive except for local zones	0 – 20	Poor	Whole Site

6.2.3.2 Groundwater Vulnerability

Groundwater vulnerability, as defined by the GSI, is the term used to represent the intrinsic and hydrogeological characteristics that determine the ease of which groundwater could be contaminated by human activities. The vulnerability of an aquifer to contamination is influenced by the leaching characteristics of the topsoil, the permeability and thickness of the subsoil, the presence of an unsaturated zone, the type of aquifer, and the amount and form of recharge (the hydraulic process where water moved downward from surface water to groundwater).

Groundwater vulnerability is determined mainly according to the thickness and permeability of the subsoil that underlies the topsoil, as both properties strongly influence the travel times and attenuation process of contaminants that could be released into the subsurface from below the topsoil.

The Groundwater Vulnerability within the site boundary is classified by the GSI as predominantly 'Moderate' with a section of the south-west of the Site classed as 'High'.

Based on the GSI aquifer vulnerability mapping, site walkovers and intrusive ground investigation overburden deposits are generally between 5 and 10m deep across most of the site with a section in the south-west comprising overburden deposits of between 3 and 5m deep. This is in line with the GI results.

A summary of the groundwater vulnerability for the site is presented in Table 6.7. This table outlines the standard ratings of vulnerability used by the GSI, with the existing site conditions highlighted based on the findings of the site investigations. The ground investigations carried out confirm the findings from the aquifer vulnerability mapping as areas of shallow bedrock were encountered across the site.

Table 6-7: Groundwater Vulnerability

Vulnerability Rating	Hydrogeological Conditions		
	Subsoil Permeability (Type) and Thickness		
	High Permeability (sand/gravel)	Moderate Permeability (sandy soil)	Low Permeability (clayey subsoil, clay, peat)
Extreme (E)	0 - 3.0 m	0 - 3.0 m	0 - 3.0 m
High (H)	> 3.0 m	3.0 -10.0 m	3.0 - 5.0 m
Moderate (M)	N/A	>10.0 m	5.0 - 10.0 m[29]
Low (L)	N/A	N/A	>10 m

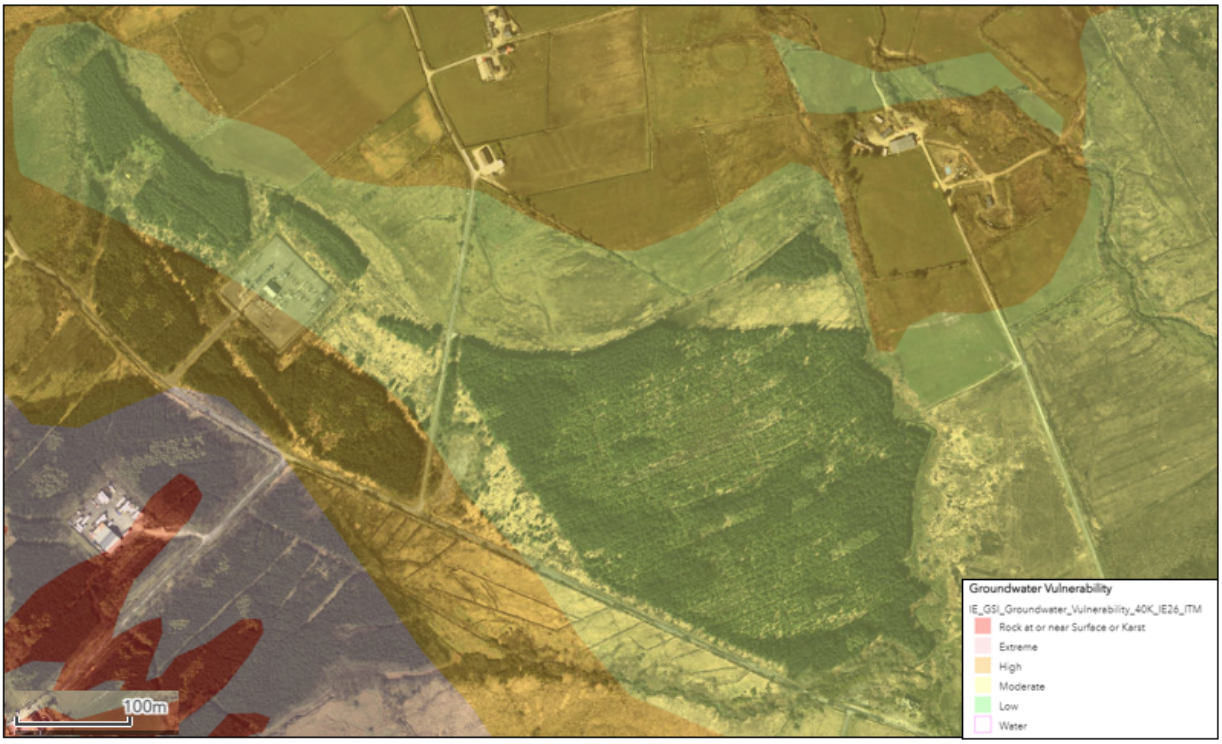

Figure 6-2: Groundwater Vulnerability Map

6.2.3.3 Karst Features

There are no karst features within proximity of the site.

[29] These values are based off a review of both the GSI online mapping and the ground investigation results.

6.2.4 Geological Heritage

The GSI - Irish Geological Heritage Section (IGH) and NPWS (National Parks and Wildlife Service) have undertaken a programme to identify and select important geological and geomorphological sites throughout the country for designation as NHAs (Natural Heritage Areas) – the Irish Geological Heritage Programme. This is being addressed under 16 different geological themes. For each theme, a larger number of sites (from which to make the NHA selection) are being examined, to identify the most scientifically significant. The criterion of designating the minimum number of sites to exemplify the theme means that many sites of national importance are not selected as the very best examples. However, a second tier of County Geological Sites (CGS) (as per the National Heritage Plan) means that many of these can be included in County Development Plans and receive a measure of recognition and protection through inclusion in the planning system.

The GSI Online Irish Geological Heritage database indicates that the site is not located in an area of specific geological heritage interest. The nearest site of significant geological heritage features to the Site is located approximately 5km to the west of the proposed development which is Lough Swilly. Lough Swilly is described by the GSI as a long, wide fjord bordered by cliffs that passes to gentler coastal slopes and shallow flats.

6.2.5 Economic Geology

The GSI Online Minerals Database accessed via the Public Data Viewer shows a number of active and historic quarries and mineral occurrences surrounding the site. The nearest quarry is identified as Cassidy Brothers Quarry, located 1km north-west of the site. McDaids quarry is also close to the proposed development area and is located 5km south of the site.

The GSI Aggregates database indicates that there is high potential for crushed rock aggregate across the Site. There is also a very low to low potential for granular aggregate across the site. This means that there will be more imported material required during the construction phase of the development.

Table 6-8: Material Balance Table

Infrastructure Element	Description	Peat Volume[30] (m^3)	Spoil (non-peat) Volume1 (m^3)
Material to be excavated			
Long Duration Energy Storage Compound	Surface area of 2.9 Ha at 0.5m deep	13,340	2900
Under the Fence (UTF) Transformer Compound	Surface area of 3,600m^2 at 0.5m deep	1656	414
Temporary Construction Compound	Surface area of 1,500m^2 at 0.5m deep	690	173
New Access Roads	375m of new access road that is 3.5m wide	604	151

[30] A factor of 15% (bulking factor of 10% and contingency factor of 5%) has been applied to the excavated peat and spoil volumes to allow for expected increase in volume upon excavation and to allow for a variation in ground conditions across the site.

Infrastructure Element	Description	Peat Volume[30] (m^3)	Spoil (non-peat) Volume1 (m^3)
Material to be excavated			
Total material to be excavated (m^3)		16,290	4,072
		20,362	

Peat and spoil (non-peat material) will be reused across the Site for landscaping and reinstatement purposes where feasible, with any excess material removed from site to a licenced facility. It has been assumed, for the purposes of worst case, that 25 % of the of the above potential estimated material shall be used for landscaping and reinstatement purposes, with 75 % of material being removed from site to a licensed facility.

6.2.6 Ground Investigation - Results

The peat deposits across the site were found to overlie Glacial Till deposits that consisted predominantly of a sandy, gravelly, cobbly SILT. During the ground investigations refusal was met at 1.6m in TP01 and 4.2m in TP02, indicating rock

During trial pit excavations minor shallow groundwater seepage at moderate ingress was noted in all trial pits. Table 6-9 shows the groundwater strikes encountered during the intrusive site investigations.

Table 6-9: Summary of Groundwater Encounted

Exploratory Hole ID	Groundwater Strike (m BGL)
TP01	1.6
TP02	2
TP03	1
TP04	0.5
TP05	3.6
TP06	3

6.2.7 Slope Stability Assessment

From a review of the online GSI Landslide Susceptibility database, the site is located within an area of 'Low' susceptibility.

There was no evidence of active or historical slope instability observed across the site during the site walkover. There are no historical records of landslide activity within or close to the site, according to the GSI database. The GSI information is based on a national dataset and has been superseded following a more recent walkover and study of the area. The site walkover and ground investigations including trial pits, peat probing and shear vane testing were all carried out across the site and these indicate a low risk of slope instability.

6.3 Potential Effects

The potential effects on the underlying land, soils, geology and hydrogeology at the site are assessed in the following sections for the activities associated within each phase (construction, operation and decommissioning) for the proposed Development as described in Section 2.

The potential impacts are assessed in accordance with the evaluation criteria outlined in Section 6.1. The unmitigated potential impacts are summarised in Tables 6-10 and 6-11. The proposed mitigation measures are then considered to reduce or eliminate potential impacts.

6.3.1 Do Nothing Impact

If the proposed Ballynahone LDES were not constructed, it is likely that the current land uses will continue for the foreseeable future. The impact on the land, soils, geology and hydrogeology would remain largely unaltered as a result.

6.3.2 Construction Phase

The following on-site activities have been identified as the sources of potential impacts on the existing geological and hydrogeological conditions during the construction phase of the proposed development and are discussed in the sub-headings below:

- Tree Felling;
- Earthworks;
- Internal Cabling and Grid Connection.

6.3.2.1 Tree Felling

An area of the Site comprises commercial coniferous forestry.

Felling of approximately 4.7 ha of coniferous forestry is required within and around the proposed development to accommodate construction.

Proposed tree felling will involve the use of heavy felling machinery and exposure of underlying soils to surface water runoff, which could result in soil erosion. This also could lead to an increase in sediment and nutrient concentrations in the surface water run-off which may in turn impact groundwater in the Poor Aquifer beneath the Site.

The use of plant and machinery during tree felling works will require the storage and use of fuels and oils. Their storage and use present potential for spills and leaks which could contaminate underlying exposed soils and groundwater.

The Magnitude of the impact from these works on the soils and geology receptors is considered to be 'Moderate Adverse' in nature. The importance is considered to be 'Medium'. The rating of these potential impacts, prior to mitigation, is considered to be of Moderate significance. The Impact Classification is negative, permanent, direct and will have likely effects.

6.3.2.2 Earthworks

The proposed Ballynahone LDES development will require construction phase earthworks associated with the excavation of foundations, temporary site compounds, access tracks and grid connection trenches.

As such there is the potential for impact to the land, soil, geology and hydrogeology from the excavation and movement of existing Peat and Glacial Till deposits during the construction phase of the proposed development.

The following earthworks excavations will be required:

- Excavation of Peat deposits
- Excavation of Glacial Till

The following filling and material deposition operations will be required:

- Removal of peat and unsuitable material that cannot be used as site-won material;
- Importation and Filling of site won and imported General Fill and Engineering Aggregates

Temporary stockpiles (not exceeding 2m in height) of material will be located adjacent to the excavation areas prior to reinstatement, however no long-term stockpiles of material will remain after construction. Temporary stockpiles will be shaped and sealed to prevent the ingress of water from rainfall.

To mitigate against the compaction of soil at the site, prior to the commencement of any earthworks, the work corridor will be pegged, and machinery will stay within this corridor so that peatland/soils outside the work area are not damaged.

To mitigate against erosion of the exposed soil or rock, all excavations will be constructed and backfilled as quickly as possible. Excavations will stop during or prior to heavy rainfall events. To mitigate against possible contamination of the exposed soils and bedrock, refuelling of machinery and plant will only occur at designated refuelling areas within the temporary construction compound.

Direct impacts to the existing geological regime associated with the construction phase of the proposed development are:

- Soil compaction may occur due to movement of construction traffic. This will occur particularly within areas of highly compressible soft deposits which are left in-situ during the construction phase. This could lead to an increase in surface water runoff due to reduced infiltration of rainfall and subsequently to an increase in erosion of overburden deposits left in-situ.
- The use of plant and machinery during construction will require the storage and use of fuels and oils. Their storage and use present potential for spills and leaks which could contaminate underlying exposed soils.
- During construction, imported engineering fill and excavated soils will be exposed in excavations and in temporary stockpiles. These soils will be subject to erosion by wind and rain which could deposit silt in streams with an indirect impact on surface water quality.

The Magnitude of the impact from these works on the soils and geology receptors is considered to be 'Small Adverse' in nature. The importance is considered to be 'Medium'. The rating of these potential impacts, prior to mitigation, is considered to be of Slight significance. The Impact Classification is negative, permanent, direct and will have likely effects.

Direct impacts to the existing hydrogeological regime associated with earthworks associated with the construction phase of the proposed development are:

- Potential for groundwater pollution from the removal of overburden deposits at all locations where excavations will occur. The groundwater vulnerability underlying the Site is classified by the GSI as ranging from 'Moderate' to 'High'. The vulnerability of the aquifer to groundwater pollution particularly during construction stage will be increased as overburden is removed thus reducing the level of protection from groundwater pollution.
- Potential for silt infiltration to groundwater as a result of increased surface runoff and reduced protection of the aquifer. Soil erosion as a result of exposure of soils in open excavations and temporary storage of excavated materials represents a potential impact to the underlying groundwater aquifer.

During the construction phase, the effect on groundwater will be moderate based on the depth of excavation required for the foundations.

The Magnitude of the impact from these works on the soils and geology receptors is considered to be 'Small Adverse' in nature. The importance is considered to be 'Medium'. The rating of these potential impacts, prior to mitigation, is considered to be of Slight significance. The Impact Classification is negative, permanent, direct and will have likely effects.

6.3.2.3 Internal Cabling and Grid Connection

Connection works to Trillick substation will involve the installation of ducting and ancillary infrastructure and the subsequent running of cables underground. This will require excavation, laying of cables and subsequent reinstatement of trenches. The trenches within these locations will generally be backfilled using the excavated material.

Direct impacts to the existing environment associated with the proposed internal cabling and grid connection works include:

- The proposed gird connection, associated excavations and ducting may present a preferential pathway for the movement of groundwater and/or contamination in the subsurface.
- The excavations for the grid connection trenches can have a direct impact on the exposed soils and rock in the form of increased erosion from surface water ingress.

Given that the open sections of the trench will be backfilled following the installation of each section of ducting the Magnitude of the impact from these works on the soils and geology receptors is considered to be 'Small Adverse' in nature. The importance is considered to be 'Medium'. The rating of these potential impacts, prior to mitigation, is considered to be of Slight significance. The Impact Classification is negative, permanent, direct and will have likely effects.

6.3.2.4 Conclusion for Effects During Construction

In summary, the overall magnitude of these potential direct impacts associated with the construction phase of the proposed development, prior to mitigation, is considered to be a Short Term, Negative Impact of **Slight** to **Moderate Significance**.

Following the identification of the potential direct impacts during the construction phase, as outlined above, mitigation measures to reduce the risk to an acceptable level are discussed in Section 6.5.2.

6.3.3 Potential Indirect Impacts

Imported granular material will be required for the proposed development. This will place a demand on local aggregate extraction facilities.

The magnitude of these potential impacts, prior to mitigation, is considered to be of **Slight Significance**.

6.3.4 Operational Phase

The potential impacts on land, soils, geology and hydrogeology from the operation of the proposed development are outlined hereunder.

6.3.4.1 Potential Direct Impacts

Very few potential direct impacts are envisaged during the operational phase of the proposed development.

These include:

- Some construction/operations traffic may be necessary for maintenance which could result in minor accidental leaks or spills of fuel/oil which is a potential risk to groundwater.

The magnitude of these potential impacts, prior to mitigation, is considered to be of **Slight Significance**.

6.3.4.2 Potential Indirect Impacts

A small amount of granular material may be required to maintain access tracks during operation which will place intermittent minor demand on local quarries.

The magnitude of these potential impacts, prior to mitigation, is considered to be of **Slight Significance**.

6.3.5 Potential Impacts during Decommissioning

The potential impacts associated with decommissioning will be similar to those associated with construction but of reduced magnitude.

Other impacts such as possible soil compaction and contamination by fuel leaks will remain in the longer term but will be of reduced magnitude due to having specific refuelling areas and marked out working corridors.

Table 6-10: Summary of Unmitigated Impact Significance on Land, Soils, Geology and Hydrogeology Attributes

Activity	Potential Impact	Receptor	Sensitivity	Prior to Mitigation	
				Magnitude	Significance
Construction Phase					
Earthworks	Removal of overburden material, open excavations and subsequent exposure underlying overburden and bedrock leading to increased erosion. Construction traffic resulting soil compaction and increase in surface water runoff resulting in increased erosion of exposed soils.	Local organic soils and Glacial Till deposits.	Medium	Moderate Adverse	Moderate
Felling Activities	Exposure of underlying overburden leading to increased erosion. Felling machinery resulting soil compaction of soft deposits and an increase in surface water runoff resulting in increased erosion of exposed soils.	Local organic soils and Glacial Till deposits.	Medium	Moderate Adverse	Moderate
Construction of Internal Site Access Tracks, Hardstands and Temporary Compound	Open excavations, increased runoff causing erosion of underlying overburden and bedrock. Construction traffic resulting soil compaction and increase in surface water runoff resulting in increased erosion of exposed soils. Importation of engineering fill	Local, organic soils and Glacial Till deposits. Bedrock Local quarries	Medium	Moderate Adverse	Moderate
Construction of Foundations	Open excavations, increased runoff causing erosion of underlying overburden and bedrock. Construction traffic resulting soil compaction and increase in surface water runoff resulting in increased erosion of exposed soils. Importation of engineering fill and concrete products	Local organic soils and Glacial Till deposits. Bedrock Local quarries	Medium	Moderate Adverse	Moderate

Activity	Potential Impact	Receptor	Sensitivity	Prior to Mitigation	
				Magnitude	Significance
Construction of the Grid Connection and Internal Cabling	Removal of overburden material and exposure underlying Gravel and Bedrock to erosion. Construction traffic resulting soil compaction and increase in surface water runoff resulting in increased erosion of exposed soils. Importation of engineering fill and concrete products Disposal of surplus excavated material to licenced facility	Local, organic soils and Glacial Till deposits. Bedrock Local quarries Licenced Waste Facilities	Medium	Small Adverse	Slight
Operational Phase					
Maintenance of access tracks	Importation of engineering fill	Local quarries	Medium	Small Adverse	Slight
Cumulative Impacts					
Construction of the proposed development and associated infrastructure Potential for requirement of imported aggregate for maintenance of access tracks.	Cumulative impacts on local quarries from extraction of fill for proposed development	Local quarries	Medium	Negligible	Imperceptible

Table 6-11: Summary of Potential Unmitigated Impact Significance on Hydrogeology Attributes

Activity	Potential Impact	Receptor	Sensitivity	Prior to Mitigation	
				Magnitude	Significance
Construction Phase					
Earthworks	Potential for ground water pollution from the removal of overburden deposits. Potential for silt infiltration to groundwater as a result of increased surface runoff and reduced protection of the aquifer Potential for contamination to groundwater from spills/leakages during construction phase earthworks. Reduction in groundwater levels from dewatering of excavation as required during the construction phase	Lough Swilly GWB Poor Bedrock Aquifer Groundwater Wells and Springs	Medium	Moderate Adverse	Moderate
Felling Activities	Potential for silt infiltration to groundwater as a result of increased surface runoff and reduced protection of the aquifer Potential for contamination to groundwater from spills/leakages from felling machinery	Lough Swilly GWB Poor Bedrock Aquifer Groundwater Wells and Springs	Medium	Moderate Adverse	Moderate
Construction of Internal Site Access Tracks, Hardstands and Temporary Compound	Potential for ground water pollution from the removal of overburden deposits. Potential for silt infiltration to groundwater as a result of increased surface runoff and reduced protection of the aquifer Potential for contamination to groundwater from spills/leakages during construction phase earthworks.	Lough Swilly GWB Poor Bedrock Aquifer Groundwater Wells and Springs	Medium	Moderate Adverse	Moderate

Activity	Potential Impact	Receptor	Sensitivity	Prior to Mitigation	
				Magnitude	Significance
	Potential for ground water pollution from the use of cement-based compounds during the construction phase				
Construction of Foundations	Potential for silt infiltration to groundwater as a result of increased surface runoff and reduced protection of the aquifer Potential for contamination to groundwater from spills/leakages during construction phase earthworks. Potential for ground water pollution from the use of cement-based compounds during the construction phase. Reduction in groundwater levels from dewatering of excavation as required during the construction phase	Lough Swilly GWB Poor Bedrock Aquifer Groundwater Wells and Springs	Medium	Moderate Adverse	Moderate
Construction of the Grid Connection and Internal Cabling	Potential for ground water pollution from the removal of overburden deposits. Potential for silt infiltration to groundwater as a result of increased surface runoff and reduced protection of the aquifer Potential for contamination to groundwater from spills/leakages during construction phase earthworks.	Lough Swilly GWB Poor Bedrock Aquifer Groundwater Wells and Springs	High	Small Adverse	Moderate/ Slight
Operation					
Operational traffic, refuelling of vehicles	Some operational traffic will be necessary for maintenance plus normal operational traffic which could result in minor accidental leaks or spills of fuel/oil.	Lough Swilly GWB Poor Bedrock Aquifer Groundwater Wells and Springs	Medium	Small Adverse	Slight

6.4 Mitigation Measures

The following section outlines appropriate mitigation measures by design and best practice to avoid or reduce the potential impact of the proposed development.

6.4.1 Mitigation by Design and Best Practice

With regard to the proposed development, detailed design and best practice will be implemented. As part of the preliminary design, the following was carried out:

Extensive peat probing to identify areas of peat deposits across the site:

Peat probes were taken across the site area. During the site walkover and ground investigations it was found that the peat depth across the site ranges from 0.1m to 1m in depth with an average depth of 0.4m. The peat depth across the site is predominantly less than 0.5m with some localised areas in the north-east where the depth reaches 1m and in the west of the site where the depth reaches 0.9m. The site is gently sloped with slopes ranging from 2 to 6 degrees.

Excavation of trial pits to establish characteristics:

Trial pits were carried out at 6 no. locations across the site. The reason for the trial pits was to confirm the base of the peat depth already provided by the peat probing and to identify the material underlying the peat.

Each method listed above identified key constraints across the site such as areas of deeper peat and any areas with steep slopes. The development has been placed in the areas with shallower peat and gentler slopes where possible to avoid any instability issues.

6.4.1.1 Construction Phase

The following sections outline appropriate mitigation measures to avoid or reduce the potential impact of the proposed development.

Extensive work has already been undertaken to apply risk avoidance by design which included:

- The layout of the proposed infrastructure is based on an assessment of the existing conditions which included site investigations and peat probing.
- The excavation and construction related works will be undergo further design risk assessment at detailed design stage to confirm risk levels for the construction, operation and maintenance of the works. Identified impacts will be minimised by the application of principles of avoidance, prevention and protection.
- A detailed method statement for each element of the works will be prepared by the Contractor prior to any element of the work being carried out.
- Given that the works comprise excavation and earthworks, suitably qualified and experienced geotechnical personnel will be on site to supervise the works.
- The Contractor / Developer will require programming of the works such that earthworks are not scheduled during severe weather conditions such as red weather warnings or periods of heavy rainfall and wind.

6.4.1.2 Tree Felling

As outlined in Section 6.3.2.1 potential impacts to the existing environment from the proposed tree felling works have been identified. The felling works will lead to the exposure of underlying soils to surface water runoff, which could result in soil erosion. This also could lead to an increase in sediment and nutrient concentrations in the surface water run-off which may in turn impact groundwater in the Poor Aquifer beneath the proposed development site.

One of the primary mitigation measures to be employed at the construction phase of the development is the management of silt laden runoff and appropriate surface water drainage incorporating SuDS. The potential impact from silt laden surface water runoff from increased erosion of exposed overburden deposits will be assessed at site-specific locations particularly at drainage locations, watercourses and where tree felling works are proposed.

To minimise the impact to surface water quality, existing forestry drainage will be maintained outside the immediate site area, and where appropriate additional site drainage and settlement ponds will be installed as required prior to construction activities. Silt fencing will be installed in all drainage and monitoring of water quality undertaken during the tree felling works.

The use of plant and machinery during tree felling works will require the storage and use of fuels and oils. Storage tanks, used to store fuel for the various items of machinery, will be self-contained and double-walled. Refuelling of felling plant and equipment will be carried out from these tanks or from delivery vehicles at designated refuelling areas.

Specific mitigation measures relating to the management of hydrocarbons are outlined below in the 'Measures for Spills' Section.

6.4.1.3 Earthworks

Temporary stockpiles (not exceeding 2m in height) of material will be located adjacent to the excavation areas prior to reinstatement, however no long-term stockpiles of material will remain after construction. Stockpiles will be covered over during extreme rainfall to prevent any surface water contamination and should be left in place for no longer than a week at a time.

To mitigate against the compaction of soil at the site, prior to the commencement of any earthworks, the work corridor will be pegged, and machinery will stay within this corridor so that soils outside the work area are not damaged. Excavations will then be carried out from access tracks, as they are constructed in order to reduce the compaction of soft ground.

To mitigate against erosion of the exposed soil, all excavations will be constructed and backfilled as quickly as possible. However, timelines for this will depend on the level of excavation required and type of materials present at each location.

Soil excavated from trenches along the proposed grid connection route will be reused on site.

6.4.1.4 Measures for Spills

Storage tanks, used to store fuel for the various items of machinery, will be self-contained and double-walled. Refuelling of construction vehicles will be carried out from these tanks or from delivery vehicles at designated refuelling areas.

Specific mitigation measures relating to the management of hydrocarbons are as follows:

- Fuels, lubricants and hydraulic fluids for equipment used on the construction site will be carefully handled to avoid spillage.
- Any spillage of fuels, lubricants or hydraulic oils will be immediately contained, and the contaminated soil removed from the site and properly disposed of.
- Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the site for disposal or re-cycling; and
- Appropriate spill control equipment, such as oil soakage pads, will be kept within the construction area and in each item of plant to deal with any accidental spillage.

6.4.1.5 Groundwater

To mitigate against the increased vulnerability of the underlying aquifer to groundwater pollution, all excavations will be constructed and backfilled as quickly as possible. Excavations will stop during or prior to heavy rainfall events. To mitigate against possible contamination of the underlying groundwater, refuelling of machinery and plant will only occur at designated refuelling areas. Details of mitigation measures related to spills and fuel storage are outlined above.

Given the limited depth of the excavations during the construction phase and the distance to sensitive groundwater receptors the potential risk posed to groundwater supply wells is considered to be Imperceptible following the implementation of mitigation measures discussed in both the 'Earthworks' and 'Tree Felling' Sections.

If, however, in the exceedingly unlikely event of a previously unknown domestic well being impacted by the proposed development, an alternative supply will be provided – either a connection to mains water or a replacement well will be drilled.

Grid connection and internal cable trenches could provide preferential pathways for groundwater and contaminant movement. Trenches will be excavated during dry periods in short sections (of approximately 50m – 100m) and left open for minimal periods, to avoid acting as a conduit for surface water flows. No excavations will be carried out in heavy rainfall. To further mitigate the risk of cable trenches becoming preferential pathways, clay plugs (or other low permeability material) will be installed at regular intervals along the trench to stop / inhibit water movement.

6.4.2 Mitigation Measures during Operation

It is not envisaged that the operation of the proposed development will result in significant impacts on the geological and hydrogeological regimes within the study area, as there will be no further disturbance of overburden post-construction.

6.4.3 Mitigation Measures during Decommissioning

Mitigation measures applied during decommissioning activities will be similar to those applied during construction where relevant.

Mitigation measures to avoid contamination by accidental fuel leakage and compaction of soil by on-site plant will be implemented as per the construction phase mitigation measures outlined above.

6.5 Residual Impacts

It can be observed from Tables 6-12 and 6-13 that, following the implementation of mitigation measures, the residual impact significance to the receiving environment would be imperceptible during the construction period and imperceptible during the operation of the proposed development. Mitigation measures will be monitored throughout the construction, operational and decommissioning phases.

6.6 Cumulative Impacts

The proposed development is not expected to contribute to any significant, negative cumulative effects of other existing or known developments in the vicinity.

6.6.1 Existing Forestry Activities

The residual impact of the project is concluded to be not significant on the land, soils, geology and hydrogeology of the site. For each stage of the project mitigation measures are proposed to achieve a 'not significant' impact on the land, soils, geology and hydrogeology of the site. Tree felling will be permitted under limited felling license(s) from the Forest Service and will be subject to the conditions of such a license. Tree felling of the surrounding commercial forest will implement similar measures as proposed for the project. Therefore, no cumulative impact is envisaged.

6.6.2 Local Quarries

Slight residual cumulative effects from the excavation of fill material from local quarries are considered to result from the proposed development by placing demand on existing quarries during the construction phase of the development. However, the cumulative impact will be negligible.

Table 6-12: Residual Impact Significance for Sensitive Geological Attributes

Activity	Potential Impact	Receptor	Sensitivity	Prior to Mitigation		Post Mitigation	
				Magnitude	Significance	Magnitude	Significance
Construction Phase							
Earthworks	Removal of overburden material, open excavations and subsequent exposure underlying overburden and bedrock leading to increased erosion. Construction traffic resulting soil compaction and increase in surface water runoff resulting in increased erosion of exposed soils. Extraction of bedrock from borrow pits resulting in the reduction in the availability of an exhaustible resource.	Peat and Glacial Till deposits. Bedrock	Medium	Moderate	Moderate	Negligible	Imperceptible
Felling Activities	Exposure of underlying overburden leading to increased erosion. Felling machinery resulting soil compaction of soft deposits and an increase in surface water runoff resulting in increased erosion of exposed soils.	Peat and Glacial Till deposits.	Medium	Moderate	Moderate	Negligible	Imperceptible
Construction of Internal Site Access Tracks, Hardstands and Temporary Compound	Open excavations, increased runoff causing erosion of underlying overburden and bedrock. Construction traffic resulting soil compaction and increase in surface water runoff resulting in increased erosion of exposed soils. Importation of engineering fill	Peat and Glacial Till deposits. Bedrock Local quarries	Medium	Moderate	Moderate	Negligible	Imperceptible

Activity	Potential Impact	Receptor	Sensitivity	Prior to Mitigation		Post Mitigation	
				Magnitude	Significance	Magnitude	Significance
Construction of Foundations	Open excavations, increased runoff causing erosion of underlying overburden and bedrock. Construction traffic resulting soil compaction and increase in surface water runoff resulting in increased erosion of exposed soils. Importation of engineering fill and concrete products	Peat and Glacial Till deposits. Bedrock Local quarries	Medium	Moderate	Moderate	Negligible	Imperceptible
Construction of the Grid Connection and Internal Cabling	Removal of overburden material and exposure underlying Gravel and Bedrock to erosion. Construction traffic resulting soil compaction and increase in surface water runoff resulting in increased erosion of exposed soils. Importation of engineering fill and concrete products Disposal of surplus excavated material to licenced facility	Peat and Glacial Till deposits. Bedrock Local quarries Licenced Waste Facilities	Medium	Small Adverse	Slight	Small Adverse	Imperceptible
Operational Phase							
Maintenance Traffic	Release of hydrocarbons or fuel spill	Peat and Glacial Till deposits. Bedrock.	Medium	Small Adverse	Slight	Negligible	Imperceptible
Maintenance of access tracks	Importation of engineering fill	Local quarries	Medium	Small Adverse	Slight	Small Adverse	Imperceptible

Activity	Potential Impact	Receptor	Sensitivity	Prior to Mitigation		Post Mitigation	
				Magnitude	Significance	Magnitude	Significance
Cumulative Impacts							
Construction of the proposed development and associated infrastructure	Cumulative impacts on local quarries from extraction of fill for proposed development	Local quarries	Medium	Negligible	Imperceptible	Negligible	Imperceptible

Table 6-13: Residual Impact Significance for Sensitive Hydrogeological Attributes

Activity	Potential Impact	Receptor	Sensitivity	Prior to Mitigation		Post Mitigation	
				Magnitude	Significance	Magnitude	Significance
Construction Phase							
Earthworks	Potential for ground water pollution from the removal of overburden deposits. Potential for silt infiltration to groundwater as a result of increased surface runoff and reduced protection of the aquifer Potential for contamination to groundwater from spills/leakages during construction phase earthworks. Reduction in groundwater levels from dewatering of excavation as required during the construction phase.	Lough Swilly GWB Poor Bedrock Aquifer	Medium	Moderate	Moderate	Negligible	Imperceptible

Activity	Potential Impact	Receptor	Sensitivity	Prior to Mitigation		Post Mitigation	
				Magnitude	Significance	Magnitude	Significance
Felling Activities	Potential for silt infiltration to groundwater as a result of increased surface runoff and reduced protection of the aquifer Potential for contamination to groundwater from spills/leakages from felling machinery	Lough Swilly GWB Poor Bedrock Aquifer	Medium	Moderate	Moderate	Negligible	Imperceptible
Construction of Internal Site Access Tracks, Hardstands and Temporary Compound	Potential for ground water pollution from the removal of overburden deposits. Potential for silt infiltration to groundwater as a result of increased surface runoff and reduced protection of the aquifer Potential for contamination to groundwater from spills/leakages during construction phase earthworks. Potential for ground water pollution from the use of cement-based compounds during the construction phase	Lough Swilly GWB Poor Bedrock Aquifer	Medium	Moderate	Moderate	Negligible	Imperceptible
Construction of Foundations	Potential for silt infiltration to groundwater as a result of increased surface runoff and reduced protection of the aquifer Potential for contamination to groundwater from spills/leakages during construction phase earthworks. Potential for ground water pollution from the use of cement-based compounds during the construction phase	Lough Swilly GWB Poor Bedrock Aquifer	Medium	Medium	Moderate	Negligible	Imperceptible

Activity	Potential Impact	Receptor	Sensitivity	Prior to Mitigation		Post Mitigation	
				Magnitude	Significance	Magnitude	Significance
Construction of the Grid Connection and Internal Cabling	Potential for ground water pollution from the removal of overburden deposits. Potential for silt infiltration to groundwater as a result of increased surface runoff and reduced protection of the aquifer Potential for contamination to groundwater from spills/leakages during construction phase earthworks.	Lough Swilly GWB Poor Bedrock Aquifer	High	Small Adverse	Moderate/Slight	Negligible	Imperceptible
Operation							
Maintenance Traffic	Some operational traffic will be necessary for maintenance plus normal operational traffic which could result in minor accidental leaks or spills of fuel/oil.	Lough Swilly GWB Poor Bedrock Aquifer	Medium	Small Adverse	Slight	Negligible	Imperceptible

6.7 Conclusion

The assessment of land, soil, geology and hydrogeology has established a baseline for the receiving environment for the impact assessment. Potential impacts were considered for the construction, operational and decommissioning phases of the proposed development as well as potential residual and cumulative impacts. Mitigation measures have been proposed where relevant.

The Site is not a sensitive site in terms of land, soil hydrogeology and geology and poses a low risk for peat slippage.

A number of potential impacts have been identified associated with the excavation of soil on the Site. The significance of these potential impacts is assessed as being slight to moderate significance prior to mitigation.

The Ballynahone LDES is not expected to contribute to any significant, negative cumulative effects with other existing or proposed developments in the vicinity.

With mitigation measures, outlined in Section 6.4, put in place during construction, operational and decommissioning stage the proposed development will have imperceptible significance on the land, soils, hydrogeology and geology.

7. HYDROLOGY, WATER QUALITY AND DRAINAGE

7.1 Introduction

This Section has been prepared to describe the existing hydrology and water quality of the local environment in the study area and to examine the aspects of the hydrology and water quality of the local environment that could be affected by the activities associated with the proposed development.

7.1.1 Study Area

The Study area regarding hydrology and water quality comprises of catchments, sub-catchments, sub-basins and associated hydrological features therein relevant to the proposed development. A description of the existing environment of the study area is contained in Section 1.

A detailed description of the proposed development is provided in Section 2.

7.2 Methodology

The following sources of information were considered in this assessment:

- Legislation and guidance as described below in section 1. .
- A desk-based assessment of the surface water hydrology and water quality in the catchments relevant to the development, including an assessment of the watercourses which will be intercepted and those which will receive surface water runoff from the proposed development.
- A field assessment of the existing hydrological environment, to both verify desk-based assessment and record all significant hydrological features.
- Donegal County Development Plan 2024 - 2030.

7.3 Relevant Legislation and Guidance

7.3.1 Relevant EU Directives and Legislation

Water Framework Directive (WFD)

The WFD established a new system for the protection and improvement of water quality and water dependent ecosystems. It has influenced the management of water resources and has affected conservation, fisheries, flood defence, planning and development. It has endeavoured to ensure that all impacts on water resources – physical modification, diffuse and point source pollution, abstraction or otherwise – are controlled.

The overriding purpose of the WFD is to achieve at least ‘good status’ in all European waters and to ensure that no further deterioration occurs in these waters. European waters are classified as ground waters, rivers, lakes, transitional and coastal waters. The WFD has been implemented in Ireland by dividing the island of Ireland into eight river basin districts. These districts are natural geographical areas that occur in the landscape. The Draft River Basin Management Plan 2022-2027 has been prepared by Department of Housing, Planning and Local Government. The plan sets out the actions that Ireland will take to improve water quality and achieve ‘good’ ecological status in water bodies (rivers, lakes, estuaries and coastal waters) by 2027.

The WFD has been transposed into Irish law following:

- European Communities (Water Policy) Regulations, 2003 (S.I. No. 722 of 2003)
- European Union (Water Policy) Regulations 2014 (S.I. No. 350 of 2014)
- European Communities Environmental Objectives (Surface Waters) Regulations, 2009 (S.I. No. 272 of 2009)
- European Communities Environmental Objectives (Groundwater) Regulations, 2010 (S.I. No. 9 of 2010)
- European Communities (Good Agricultural Practice for Protection of Waters) Regulations 2010 (S.I. No. 610 of 2010)
- European Communities (Technical Specifications for the Chemical Analysis and Monitoring of Water Status) Regulations, 2011 (S.I. No. 489 of 2011).

Water Framework Directive Waterbody Status

The European Communities Environmental Objectives (Surface Water) Regulations 2009 (S.I. No. 272 of 2009) (the Surface Water Regulations), give effect to the criteria and standards used for classifying surface waters in accordance with the WFD. There are five categories of surface water status: 'High', 'Good', 'Moderate', 'Poor' and 'Bad'.

A surface waterbody must achieve both good ecological status and good chemical status before it can be considered to be of good status. The chemical status of a waterbody is assessed based on certain chemical pollutants. The ecological status is assessed based on Biotic Indices or Quality (Q) Values.

The EPA Biological Quality Rating System for Rivers (Q Rating System) and its relationship with the WFD Status is shown in :

Table 7-1: EPA Q Rating System and WFD Status

Q-Value	Water Quality	WFD Status
Q5	Pristine	High
Q4-5	Very good	
Q4	Good	Good
Q3-4	Slightly Polluted	Moderate
Q3	Moderately Polluted	Poor
Q2-3	Moderate to Poor	
Q2	Poor	Bad
Q1-2	Poor to bad	
Q1	Bad	

In accordance with the Surface Water Regulations, water classified as 'High' or 'Good' must not be allowed to deteriorate. Water classified as less than good must be restored. The Surface Water Regulations also state that, for the purpose of classification, a status of less than good is assigned in the case of a waterbody where the environmental objectives are not met.

7.4 Relevant Guidance

The following guidelines were considered in the development of this Section to identify relevant objectives relating to hydrology and surface water quality:

- Guidelines on the information to be contained in Environmental Impact Assessment Reports - Draft, Environmental Protection Agency (EPA), August 2017
- Advice Notes for Preparing Environmental Impact Statements, EPA, Draft September 2015.
- The Planning System and Flood Risk Management - Guidelines for Planning Authorities - Department of Environment, Heritage and Local Government (DoEHLG) and the Office of Public Works (OPW), November 2009
- Draft River Basin Management Plan 2022-2027 (Department of Housing, Planning and Local Government).
- Environmental good practice on site guide (fourth edition) (C741)- Construction Industry Research and Information Association (CIRIA), January 2015)
- Control of water pollution from linear construction projects (C648) - Construction Industry Research and Information Association (CIRIA), December 2001
- Control of water pollution from construction sites. Guidance for Consultants and Contractors (C532) - Construction Industry Research and Information Association (CIRIA), December 2001
- The SuDS Manual C753 - Construction Industry Research and Information Association (CIRIA), 2015
- Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (Inland Fisheries Ireland, 2016).

7.4.1 Evaluation Criteria

The sensitivity of receptors, the magnitude of impacts and the probability of the impacts are assessed for subject development to determine significance of the impacts.

Thresholds for assessing the sensitivity of environment and magnitude of impacts are outlined in . Quality of effect of an impact is either 'Positive, 'Neutral' or 'Negative' and may have influence in the 'Momentary', 'Short', 'Medium' or 'Long-term'. Impacts may also be either 'Temporary' or 'Permanent'. The probability of impact can be either 'Likely' or 'Unlikely'.

7.4.2 Sensitivity of Receptors

The sensitivity of a hydrological receptor or attribute is based on its ability to absorb development without perceptible change. The sensitivity of the water environment receptors was assessed on completion of the desk study and baseline study. Levels of sensitivity which are defined in Criteria are then used to assess the potential effect that the proposed developments may have on them.

Table 7-2: Receptor Sensitivity Criteria

Sensitivity	Criteria
Not Sensitive	Receptor is of low environmental importance (e.g. surface water quality classified by EPA as A3 waters or seriously polluted), fish sporadically present or restricted). Heavily engineered or artificially modified and may dry up during summer months. Environmental equilibrium is stable and is resilient to changes which are considerably greater than natural fluctuations, without detriment to its present character. No abstractions for public or private water supplies. GSI groundwater vulnerability "Low" – "Medium" classification and "Poor" aquifer importance.
Sensitive	Receptor is of medium environmental importance or of regional value. Surface water quality classified by EPA as A2. Salmonid species may be present and may be locally important for fisheries. Abstractions for private water supplies. Environmental equilibrium copes well with all natural fluctuations but cannot absorb some changes greater than this without altering part of its present character. GSI groundwater vulnerability "High" classification and "Locally" important aquifer.
Very Sensitive	Receptor is of high environmental importance or of national or international value i.e. NHA or SAC. Surface water quality classified by EPA as A1 and salmonid spawning grounds present. Abstractions for public drinking water supply. GSI groundwater vulnerability "Extreme" classification and "Regionally" important aquifer.

7.4.3 Assessment of Significance of Hydrology Impact

Table 7-3: Impact Significance Criteria

Impact Significance	Criteria
Imperceptible	An impact capable of measurement but without noticeable consequences
Not significant	An impact which causes noticeable changes in the character of environment but without significant consequences
Slight impacts	An impact which causes noticeable changes in the character of the environment without affecting its sensitivities
Moderate impacts	An impact that alters the character of the environment in a manner that is consistent with existing and emerging trends
Significant impacts	An impact which, by its character, magnitude, duration or intensity significantly alters a sensitive aspect of the environment
Very Significant	An impact which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment
Profound impacts	An impact which obliterates sensitive characteristics

The diagram below, , shows how comparison of the character of the predicted impact to the sensitivity of the receiving environment can determine the significance of the impact. Sensitivity of the receiving environment can be 'high', 'medium', 'low', 'negligible'. Description of impact is defined by its character, magnitude, duration, probability and consequences. The magnitude of impact can be 'high', 'medium', 'low' or 'negligible'.

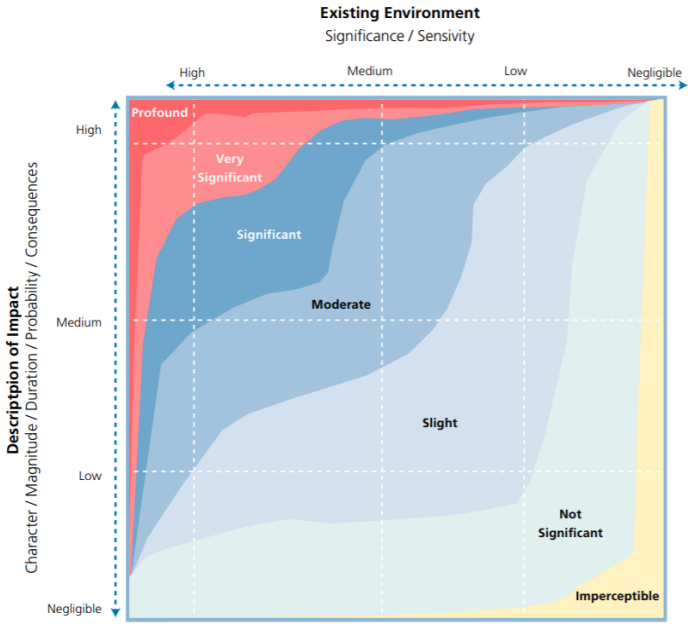

Figure 7-1: Classifications of the Significance of Impacts

7.5 Desk Study

- The desk study involved an examination of the hydrological aspects and water quality aspects of the following sources of information:
- Current and historic Ordnance Survey Ireland mapping, and ortho-photography.
- Science and stories about Integrated Catchment Management (https://www.catchments.ie/).
- OPW Indicative Flood Maps and historic flooding (https://www.floodinfo.ie/map/floodplans/).
- Review of the WFD online mapping and data (http://www.wfdireland.ie/maps.html).
- Geological Survey Ireland (www.gsi.ie).
- Review of the EPA online mapping (https://gis.epa.ie/EPAMaps/).
- Rainfall data (https://www.met.ie).
- Review of the water supply and drainage design for the proposed development.

7.6 Field Assessment

The field assessment of the existing hydrological environment within the site, was undertaken to both verify desk-based assessment, record all significant hydrological features and assess the proposed crossing points along water features. A site walkover (to include a peat probing survey) was undertaken in November 2023 and ground investigation was carried out in January 2024. The site walkover was undertaken by a FT Senior Project Geotechnical Engineer. Key tasks undertaken included;

- Identification of existing hydrological features and recording of locations for same;
- Measurements of on-site hydrological features, such as channel width, bank height and depth of water;
- Review of existing surface drainage network on and off site; and
- A photographic record of the hydrological features observed.

7.7 Existing Environment

7.7.1 General Description of the Catchments

The proposed development is located within Lough Swilly catchment, Area No. 39.

Catchment areas are broken down into sub-catchments, and sub-catchments into sub-basins (water bodies). Regarding the proposed development, it is situated within Burnfoot_SC_010 sub-catchment, and within the MILL (DONEGAL)_020 sub-basin as shown on .

The average annual rainfall in period 1991-2020 in the area of the proposed development is 1138.1 mm recorded at the Malin Head data collection point. The (M5-60) at development location is 16.4 mm according to the Flood Studies Update (FSU) data modelling produced by the OPW. This is the predicted rainfall depth in a sixty minute storm that has 20% probability to occur in a single year.

There are two small streams flowing adjacent to the site one to the west and one to the east. The site topography slopes down to the east and water draining from the site flows into the stream running along the eastern boundary of the proposed development. Both streams are tributaries of the Owenkillew River to the North.

The land is currently a planted forestry site with a gentle slope in west-east direction. There are forestry drains within the site draining to the eastern stream.

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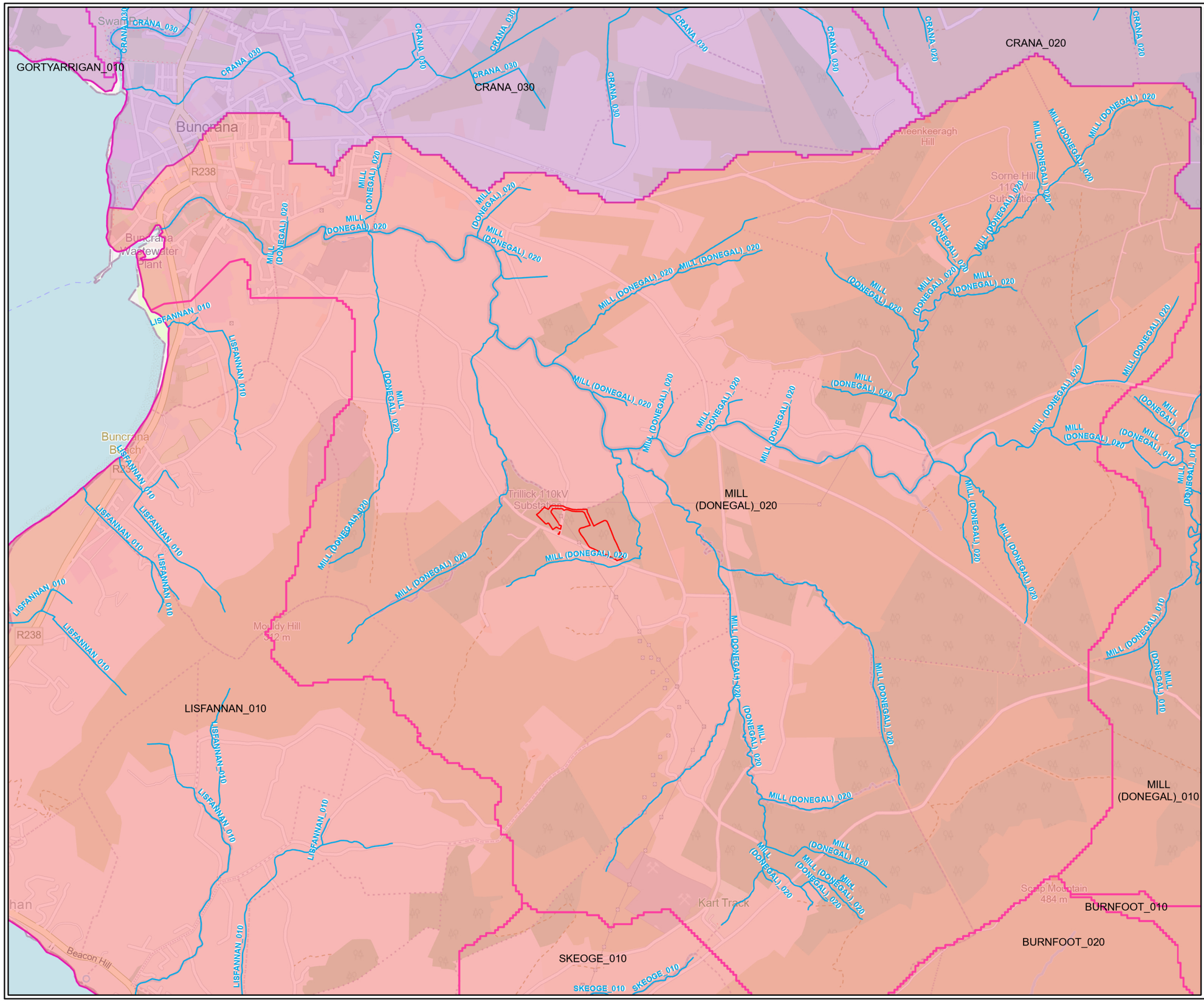

Legend

- Proposed Development Boundary
- WFD River Sub Basins
- WFD River Water Bodies

WFD Sub Catchments

Sub Catchment Name

- Burnfoot_SC_010
- Crana_SC_010

TITLE:	River Waterbody Catchments		
PROJECT:	Ballynahone Long Duration Battery Storage Planning and Environmental Services		
FIGURE NO:	7.2		
CLIENT:	FuturEnergy Ireland		
SCALE:	1:25,000	**REVISION:**	0
DATE:	9/18/2024	**PAGE SIZE:**	A3

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7.7.2 Flood Risk Identification

This section provides information whether there may be any flooding or surface water management issues relating to the proposed development site that may warrant further investigations.

Fluvial flood risk

The OPW has produced indicative flood mapping to assist in a preliminary flood risk assessment (PFRA). The PFRA mapping was prepared as part of the high-level screening exercise to identify areas for further assessment under the Catchment Flood Risk Assessment and Management (CFRAM) Programme.

Flood zones are geographical areas within which the likelihood of flooding is in a particular range, and they are a key tool in flood risk management within the planning process as well as in flood warning and emergency planning. There are three types or levels of flood zones defined for the purposes of these Guidelines:

Flood Zone A – where the probability of flooding from rivers and the sea is highest (greater than 1% or 1 in 100 for river flooding or 0.5% or 1 in 200 for coastal flooding);

Flood Zone B – where the probability of flooding from rivers and the sea is moderate (between 0.1% or 1 in 1000 and 1% or 1 in 100 for river flooding and between 0.1% or 1 in 1000 year and 0.5% or 1 in 200 for coastal flooding);

Flood Zone C – where the probability of flooding from rivers and the sea is low (less than 0.1% or 1 in 1000 for both river and coastal flooding). Flood Zone C covers all areas of the plan which are not in zones A or B.

The PFRA mapping data available of the study area indicates that the proposed development is within Flood zone C as shown on

There are no other available sources indicating there is a risk of fluvial flooding within the site.

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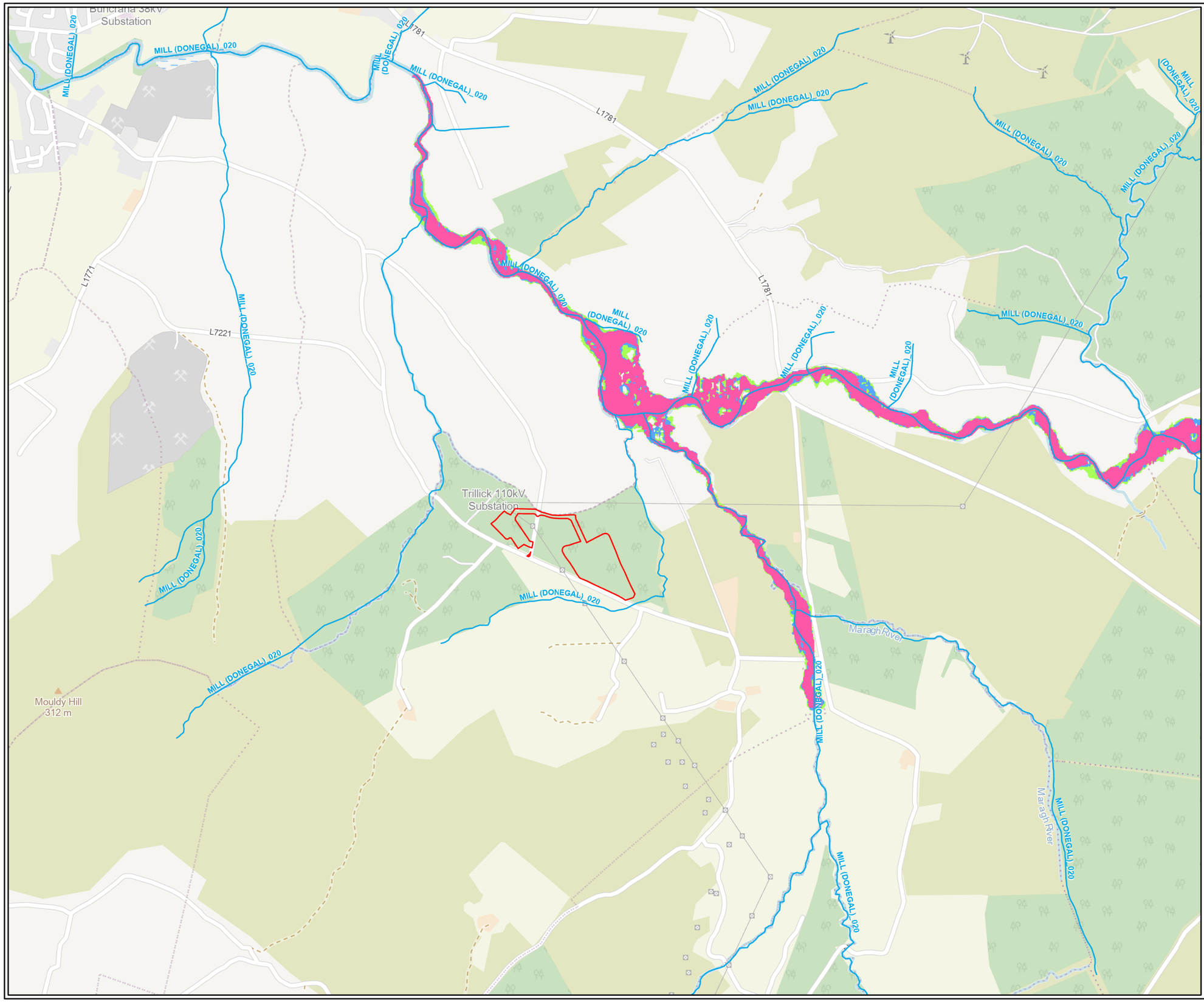

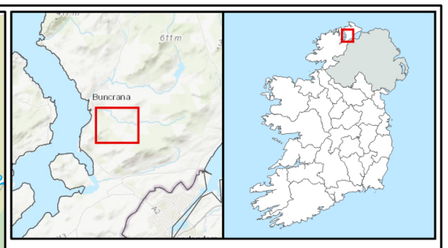

Legend

- Proposed Development Boundary
- WFD River Water Bodies
- NIFM River Flood Extents - 20Years
- NIFM River Flood Extents - 100Years
- NIFM River Flood Extents - 1000Years

TITLE:	Flood Extents		
PROJECT:	Ballynahone Long Duration Battery Storage Planning and Environmental Services		
FIGURE NO:	7.3		
CLIENT:	FuturEnergy Ireland		
SCALE:	1:15,000	**REVISION:**	0
DATE:	9/18/2024	**PAGE SIZE:**	A3

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Pluvial flood risk

Pluvial, or surface water, flooding is the result of rainfall-generated flows that arise before runoff can enter a watercourse or sewer. It is usually associated with high intensity rainfall.

No potential pluvial flooding was identified during the site visit. This is in relation with the topography data which indicates no presence of the ponded areas within the site. The site has a gentle slope in west-east direction.

Coastal flooding

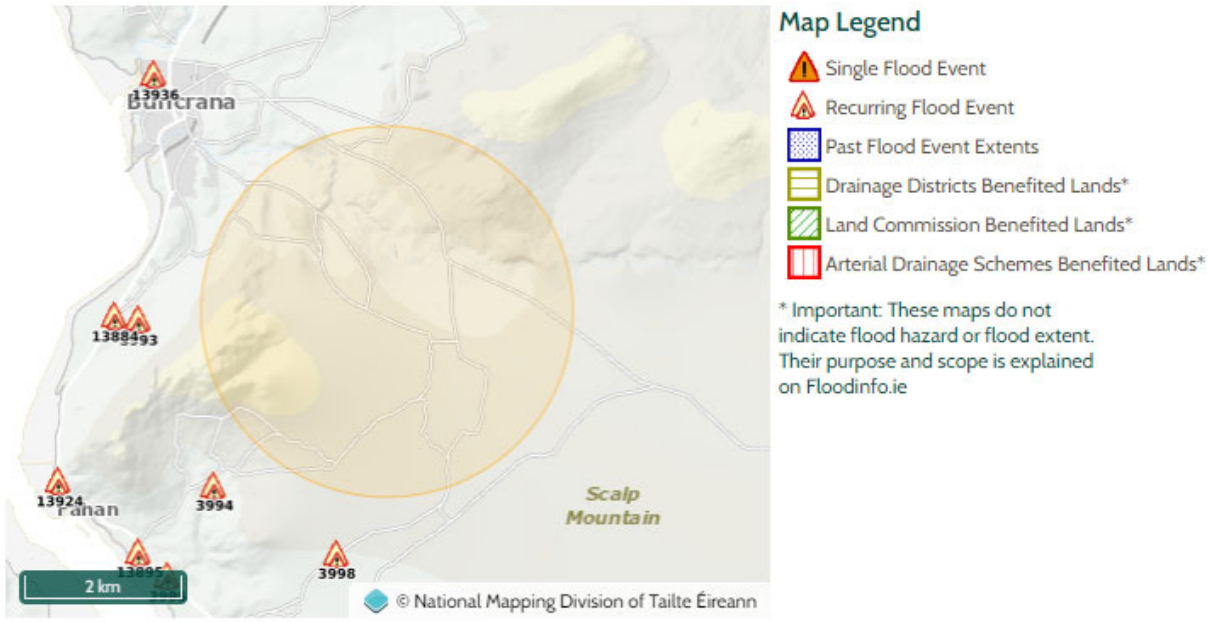
As the site is located in an upland location, approximately 2.7 km from the coast, the Proposed Development is not at risk of coastal flooding.

Groundwater flooding

The subject site has not been mapped by the GSI to predict groundwater flooding. Due to the non-karst environment in which the subject site is situated, the risk of groundwater flooding is assumed to be very low.

Historical Flooding

The national flood hazard mapping does not indicate any record of historical flooding or recurring flooding within 2.0 km of the proposed development.



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Benefiting Lands

The proposed planning boundary is not within ‘benefiting lands’ or ‘drainage districts’.

Benefitting lands are lands benefiting from an Arterial Drainage Scheme. Areas under an Arterial Drainage Scheme were recognized as areas subject to flooding or poor drainage.

OPW have a statutory duty to maintain Arterial Drainage Schemes.

Local authorities are charged with responsibility to maintain Drainage Districts.

Flood Risk Summary

The proposed development is at low risk of flooding.

It is a key mitigation of the proposed development to ensure all surface water runoff is treated (water quality control) and attenuated (water quantity/flood management control), prior to discharge at pre-existing greenfield rates. As such the mechanism by which downstream flooding is prevented and controlled is through avoidance by design. These proposed drainage attenuation measures are outlined in the impact assessment section below.

7.7.3 Water and Groundwater Quality

WFD water quality status and river waterbody risk associated with the proposed development are provided in in . It can be observed that the river status and waterbody risk are classified as ‘Poor' and 'At Risk'.

Table 7-4: Sub-Basin (Waterbody), Waterbody, River Status and Waterbody Risk for the Site

Sub-Basin (Waterbody)	Waterbody	River Status	Waterbody Risk
Long Duration Energy Storage (LDES) Facility			
MILL (DONEGAL)_020	IE_NW_39M020300	Poor	At Risk

Groundwater is important for a drinking water supply as well as the supply to surface waters. Groundwater is contained in aquifers which are the underground layers of rock which contain water. Groundwaters are classified as being either ‘Good’ or ‘Poor’.

The aquifer underlining the study area is Lough Swilly groundwater body (IEGBNI_NW_G_059) and is classified as in ‘Good’ status. The risk classification of this aquifer is 'Not at Risk'.

7.7.4 Hydrogeology

The proposed development site is located within the Lough Swilly groundwater body (IEGBNI_NW_G_059) which underlies the entire extent of the study area. Groundwater is most at risk where the subsoils are absent or thin and, in areas of karstic limestone, where surface streams sink underground at swallow holes.

The underlying aquifer is classified as a "Poor Aquifer - Bedrock which is Generally Unproductive except for Local Zones".

The Groundwater Subsoil Permeability map classifies how easily water can infiltrate subsoils downwards at any point in the land surface. Permeability across the country is classified as either ‘High’, ‘Moderate’ or ‘Low’. The area underlying the proposed development is classified as "Low".

The main construction area of the proposed development is located in a groundwater vulnerability area classified by the GSI as Medium (M) with some of the area related infrastructure to the western side of the site classified as High (H). The vulnerability rating reflects the varying depth of local subsoils and peat.

7.7.5 Receptor Sensitivity

Potential impacts to groundwater are dealt with in Section 6.

These are common potential effects on all construction sites. These potential contamination sources are to be carefully managed at the site during the construction phase of the development and mitigation measures are proposed in Section 1. to deal with these potential minor effects.

The closest watercourse to the proposed development is the stream running along the eastern boundary of the site. There are open drains within the site running into this watercourse. Suitable measures to mitigate the risk of contamination to this stream are proposed in

Based on that, it is concluded that the receiving environment is of low sensitivity.

7.8 Proposed Drainage

A drainage design has been prepared for the site as shown on 0500 Series planning application drawings. The drainage design has been designed to take account of existing topography, land cover and existing hydrological features. Existing small forestry drains are present on the site draining towards the river (MILL (DONEGAL)_020). A number of these drains shall be removed as part of the construction of the proposed development and replaced by the proposed drainage system.

A key design philosophy employed for surface water management is the use of existing forestry tracks where available alongside the implementation of Sustainable Drainage Systems (SuDS). This design approach ensures that existing drainage patterns will be maintained throughout the site.

The drainage system will be constructed alongside compound hard standings and internal access tracks. Existing track drainage shall be retained.

Surface water runoff attenuation and drainage management are key elements in terms of mitigation against impacts on surface water bodies.

Two distinct methods will be employed in the management of construction surface water runoff. The first method involves keeping clean water clean by avoiding disturbance to natural drainage features, minimising any works in or around drainage features, and diverting clean surface water flow around excavations and construction areas. The second method involves collecting any drainage waste from works areas within the site that might carry silt or sediment, and to route them towards settlement ponds prior to controlled diffuse release over vegetated natural surfaces. There will be no direct discharge to surface water.

‘Clean’ water is separated from ‘dirty’ water utilizing interceptor drains. The interceptor drains will be installed on the upslope side of the construction areas. This will reduce the amount of water from construction area that will need to be treated before it can be safely discharged into the environment.

Access tracks and compound hard standings will be constructed from a permeable aggregate material to allow the runoff to infiltrate with paved surfaces kept to a minimum. The excess water will drain into swales which will be connected, during the construction stage, to the settlement ponds.

A key feature of the drainage design includes the construction of a large permanent wetland in the form of a vegetated pond with a surface area of over 1,100 m2 and over 250 m of filter trench drain which also act as tree planter boxes which will provide additional surface water attenuation throughout the operational life of the proposed development while also providing landscape vegetative screening.

Further details of the proposed drainage system can be found in the CEMP, prepared by Fehily Timoney and Company, enclosed as part of this planning application.

Details of the onsite water drainage system are shown on 0500 and 0501 series planning application drawings.

As the Proposed Development will be remotely operated, no sanitary facilities are proposed and therefore no wastewater treatment or storage is required for the operation of the facility.

As described in Section 2.1.4, there will be welfare facilities during construction in the temporary construction compound. Containerised toilets and welfare units with storage tanks will be used to provide toilet facilities for site personnel during construction. These temporary facilities shall be regularly serviced throughout the construction stage and do not require a wastewater treatment system.

A small amount of discharge water shall be produced by the onsite reverse osmosis water treatment system which will filter mains water before being circulated through the battery storage units. This water will be directed to the onsite surface water drainage system.

Based on the expected volume of fresh water required to operate the system identified by the Client, the estimated volume of discharge water from the reverse osmosis treatment system is 0.8 litres per minute. This discharge water is considered to be free of contaminants and can be accommodated within the designed surface water drainage system.

Details of the onsite water drainage system are shown on 0100 and 0501 series planning application drawings.

7.9 Potential Impacts

The potential impacts on the hydrological regime at the site and quality of waters draining the site are assessed in the following sections for the activities associated with each phase (construction, operation and maintenance) of the proposed development.

7.9.1 Do Nothing Scenario

If the proposed development does not proceed, the site will remain as forestry land for the foreseeable future.

7.9.2 Potential Impacts during Construction

New access tracks and hardstanding areas have the potential to contribute to an increase in runoff. The increase in runoff will be not significant due to access roads generally being permeable, with only a small area of paved surfaces proposed.

This will allow water to infiltrate underground. Furthermore, the proposed drainage will limit the runoff to the pre-development greenfield levels.

The effect of the increase in runoff has negligible impact on receiving waters because estimated increases in runoff are low compared to the flows within the catchment area. The impact on hydrology and water quality is ‘Not significant’,

Possible potential impacts on hydrology and water quality during construction activities include:

- Standing water in excavations could contain an increased concentration of suspended solids as a result of the disturbance of the underlying soils.
- Silt carried on the wheels of vehicles leaving the site could be carried onto the public road.
- There is a risk of accidental pollution incidents from the spillage or leakage of fuels stored on site and from construction machinery or site vehicles, the use of concrete and cement, and storage of chemical on site.
- Inappropriate site management of excavations could lead to loss of suspended solids.
- Cable trenches could act as a conduit for surface water flows.
- The construction of new infrastructure has the potential to obstruct existing overland flow.

Without any mitigation, the potential impacts listed above are 'Not significant, temporary, negative' due to the nature of the construction activities and low sensitivity of the local environment.

7.9.3 Potential Impacts during Operation and Maintenance

The increase in the runoff will be limited to the greenfield runoff with the proposed drainage system which will include filter drains and attenuation tanks. Due to the non-intrusive nature of site operations, it is unlikely there will be release of the suspended solids. There is the potential for leakage of hydrocarbons from access vehicles which could infiltrate underground, quantities would be low.

The impacts listed above are Not Significant, long-term, negative due to the sensitivity of the local environment.

Mitigation Measures and Residual Impact

7.9.4 Proposed Mitigation Measure for the Construction Stage

Surface water will be managed according to the Construction Environmental Management Plan (CEMP) which is enclosed with this application. The CEMP is based on 'best practice' and provides mitigation measures that will be implemented during the construction stage. All contractors will be required to implement the CEMP.

The CEMP is provided as a standalone report with this application.

Surface runoff

Mitigation measures will be put in place to manage runoff during construction stage. Runoff water containing silt will be contained on site via settlement ponds and treated to ensure adequate silt removal. Silt reduction measure on site will include a combination of silt fencing and settlement measures.

Weather conditions will be considered when planning construction activities to minimise the risk of runoff from the site.

Fuel and Chemical Handling

The following mitigation measures will be taken at the construction stage in order to prevent any spillages of fuels and prevent any resulting impacts to surface water systems.

- Designation of a bunded refuelling areas on the site;
- Provision of spill kit facilities at the site;
- Where mobile fuel bowsers are used the following measures will be taken:
- Any flexible pipe, tap or valve will be fitted with a lock and will be secured when not in use;
- The pump or valve will be fitted with a lock and will be secured when not in use;
- All bowsers will carry a spill kit and operatives must have spill response training; and
- Portable generators or similar fuel containing equipment will be placed on suitable drip trays.

All ready-mixed concrete will be brought to site by truck. A suitable risk assessment for wet concreting will be completed prior to works being carried out which will include measures to prevent discharge of alkaline wastewaters or contaminated stormwater to the underlying subsoil and overland. Concreting operations will be carried out only during the 'Dry days'. Met Éireann describes days with rainfall less than 1.0mm as 'Dry days'.

To reduce the volume of cementitious water, only concrete truck chutes will be washed down on site. The concrete trucks will wash down their chutes at a designated chute wash down areas within the main LDES compound and in the temporary site compound. The wash down area will consist of a polythene lined bunded area. See Surface Water Management Plan for further details

Accidental Releases

Emergency response procedures will be outlined in the detailed CEMP. All personnel working on the site will be suitably trained in the implementation of the procedures.

Soil Removal and Compaction

Temporary storage of soil will be carefully managed in such a way as to prevent any potential negative impact on the receiving environment. The material will be stored away from any surface water drains. Movement of material will be minimised to reduce degradation of soil structure and generation of dust.

The residual impact of the proposed development during construction stage on hydrology and water quality is Imperceptible, temporary, negative.

7.9.5 Proposed Mitigation Measures for Operation and Maintenance Stage

The proposed drainage will ensure that the extra water volumes generated due to the development are retained within the site and discharged at the greenfield level. Potential oily water from equipment is managed within the site through the Class 1 oil interceptors. There will be no releases of the sediments as there will be no further disturbance of soils post-construction.

A small amount of discharge water shall be produced by the onsite reverse osmosis water treatment system which will filter mains water before being circulated through the battery storage units. This water will be directed to the onsite surface water drainage system.

Based on the expected volume of fresh water required to operate the system identified by the Client, the estimated volume of discharge water from the reverse osmosis treatment system is 0.8 litres per minute. This discharge water is considered to be free of contaminants and can be accommodated within the designed surface water drainage system.

Details of the onsite water drainage system are shown on 0100 and 0501 series planning application drawings.

No specific mitigation measures are required. However best practice measures are outlined in the enclosed CEMP.

The residual impact of the proposed development during operational and maintenance stage on hydrology and water quality is Imperceptible, long-term, negative.

7.10 Cumulative Impact

Development will result in an increase in hard standing which will result in increase in run-off rate. However, each permitted development is required by the Local Authority to provide suitable attenuation on site to ensure greenfield run-off rates and that there is no increase in offsite flooding as a result of development.

The cumulative impact on water and hydrology for the construction and operation phases is anticipated to be long-term, neutral in terms of quality and of imperceptible significance, once appropriate mitigation measures to manage water quality runoff in compliance with legislative requirement are put in place for each development.

7.11 Conclusion

The hydrology at the proposed development site is characterised by existing manmade forestry drains draining to the east towards the Mill River, which runs adjacent to the eastern edge of the site flowing from south to north, eventually discharging to the sea at Buncrana. The coastal area where the river meets the sea is part of the Lough Swilly SAC.

Natural drainage patterns within the site follow the topography which slopes gently from west to east draining towards the Owenkillew River.

The proposed development site is in Flood Zone C, where the probability of flooding from rivers and the sea is 'low' (less than 0.1% of 1 in 1000 for both river and coastal flooding). Flood zone C covers all areas which are not in zones A or B, as defined in 'The Planning System and Flood Risk Management: Guidelines for Planning Authorities' published by the OPW in 2009.

Before mitigation, it is envisaged that the proposed development will have potential impacts on hydrology and water quality during the construction stage which are not significant, temporary, negative. During the operational stage, it is envisaged that potential impacts before mitigation would be not significant, temporary, negative.

A SuDS philosophy has been implemented in the drainage design which provides robust mitigation against potential impacts on hydrology and water quality. Following such mitigation, residual impacts during the construction stage are envisaged to be imperceptible, temporary, negative. Residual impacts during the operational stage are envisaged to be imperceptible, long-term, negative.

No significant cumulative impacts are envisaged on hydrology or water quality.

8. BIODIVERSITY

An EcIA was commissioned by FuturEnergy Ireland DAC, and prepared by Fehily Timoney and Company. The report evaluates the proposed Ballynahone Long Duration Energy Storage (LDES) Facility in accordance with CIEEM Guidance.

The report evaluated whether the Proposed Development will have any significant effects on habitats, species or ecosystems within the Zone of Influence (ZoI) of the Proposed Development. Mitigation was prescribed for two ecological receptors, namely badger and woodcock. Additionally, biodiversity enhancement measures were identified for the Proposed Development.

The Ecology Impact Assessment (EcIA) Report can be found in Appendix 7.

An Appropriate Assessment Screening Report has been prepared by Fehily Timoney and Company for the Proposed Development.

The Appropriate Assessment Screening Report concludes that, given the scale and nature of the potential sources, there are no likely significant effects identified to any European sites. This process has considered potential effects which may arise during all phases of the proposed project. Through an assessment of the pathways for effects and an evaluation of the sources for impacts, taking account of the processes involved and the distance of separation from European sites, it has been evaluated that there are no likely significant effects on the qualifying interests, special conservation interest or the conservation objectives of any designated European site.

The Appropriate Assessment Screening Report can be found in Appendix 8.