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Greener Ideas Limited

Profile Park Power Plant

RFI – June 2024

Greener Ideas

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Profile Park Power Plant Document Control Sheet	
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1.0 INTRODUCTION

Greener Ideas Limited (GIL) is developing a gas fired peaking power plant at a site located in Profile Park, Dublin 22. Unlike traditional power stations, peaking plants generally run only when there is a high demand for electricity, typically during morning and evening peak usage times.

The following RFI is in response to the EPA letter dated the 03/04/2024 (Reg. No.: P1196-01). The need for peaking plants on the Irish electricity grid has grown, as renewable forms of power generation increase their penetration onto the system. The variability of renewable power generation increases EirGrid's challenge to operate an efficient, safe, and secure electricity system. This is especially the case in the greater Dublin region, where demand is growing rapidly, and there is expected to be a large increase in offshore wind power generation by 2030.

The modular design of the Profile Park peaking power plant, and its fast response capability, means it can react quickly to vary its output. So, mirroring the peaks and troughs of electricity generation, from renewable generators. The proposed plant will also be part hydrogen enabled, in preparation for running on renewable gas when it is available. This is consistent with the policy objectives set out in the Climate Action Plan.

The need for the Profile Park peaking plant has also been emphasised by the operator of Ireland's electricity market SEMO, who awarded the plant a 10-year capacity market contract, starting in October 2024[1]. This in turn has prompted EirGrid to issue the plant a grid connection offer, as directed by the Commission for the Regulation of Utilities, in March 2021.

It can therefore be seen that the construction of the Profile Park peaking plant not only supports development in the local area, but also in the Greater Dublin region and is in line with policies set out in the National Development Plan and the Climate Action Plan, which target the development of circa 2,000 MW of flexible gas-fired generation capacity.

[1] SEM Capacity Market: *Final Capacity Auction Results 2024/2025 T3 Capacity Auction*

2.0 RFI ITEM NO. 1: PLANNING

ITEM 1

It is noted that an application for planning permission, which appears to be relevant to the EPA licence application, (planning reference: ABP 317297-23) is under consideration at this time. Provide a copy of the final grant of planning permission together with either:

1. a copy of the environmental impact assessment report (EIAR) (if not already submitted), and any updates relating to EIA required during the application for planning permission process, or

2. a written confirmation from An Bord Pleanála that an environmental impact assessment was not required by or under the Act of 2000 (if not already submitted).

Response – The planning permission for the substation and associated infrastructure was granted on the 25th March 2024. The Planners Report for the proposed development – ABP 317297-23- is available in Appendix A. The updated attachment includes the decision, inspectors report and EIAR.

Electrical power will be exported from the power plant's main transformer to the proposed 110 kV Baldonnell Substation. This new substation is located on land that is directly west and adjacent to the power plant. An Bord Pleanála approved the planning for this substation on 25th March 2024, under the reference ABP 317297-23. Once completed and commissioned this substation will be operated by EirGrid.

Please find attached Grant of planning permission and associated substation EIAR. The EIA Report was completed in accordance with the requirements of Directive 2011/92/EU, the Planning and Development Act 2000 to 2020 and the Planning and Development Regulations 2001 to 2021, with the information contained within the EIAR adhering to the requirements of Schedule 6 of the Regulations (Information to be Contained in EIAR).

Appendix A PLANNING - SUBSTATION

An Bord Pleanála

Board Order
ABP-317297-23

Planning and Development Acts, 2000 to 2022

Planning Authority: South Dublin County Council

Application for approval under section 182A(1) of the Planning and Development Act 2000, as amended, in accordance with plans and particulars, including an Environmental Impact Assessment Report, lodged with An Bord Pleanála on the 8th day of June 2024 by Greener Ideas Limited, care of Tobin Consulting Engineers, Block 10-4, Blanchardstown Corporate Park, Dublin.

The proposed development will consist of a 110 kilovolt electrical substation and associated grid connection, comprising of:

1. EirGrid/Electricity Supply Board Networks control room building.
2. Associated internal 15 kilovolt and 110 kilovolt underground cabling.
3. Installation of a 15/110 kilovolt transformer (TRAFO) with associated equipment including:
    - cable sealing end,
    - surge arrestor,
    - earth disconnect,
    - current/voltage transformer,
    - circuit breaker,
4. 110 kilovolt underground cable to Barnakyle 110 kilovolt substation 3 number power ducts and 2 number telecoms ducts.

5. Diesel generator.
6. Security fencing, security cameras and poles.
7. Lights/lamp poles.
8. Lightning masts.
9. Temporary construction compound.
10. All other associated site development plant and equipment and other works including surface water and foul wastewater drainage, within an overall redline boundary measuring approximately 2.6 hectares.

All within the townland of Profile Park, Baldonnell, Dublin.

Decision

APPROVE the proposed development under section 182A of the Planning and Development Act, 2000, as amended, for the following reasons and considerations and subject to the conditions set out below, and

DETERMINE under section 182B of the Planning and Development Act, 2000, as amended, the sum to be paid by the undertaker in respect of costs associated with the application, as set out in the Schedule of Costs below.

Reasons and Considerations

In coming to its decision, the Board had regard to the following:

(a) the nature, location, scale and extent of the proposed development,

(b) the characteristics of the site and its general vicinity,

(c) European, national, regional and county level support for facilitating the improvement and stability of the national and local grid as set out in documents such as:

- The Governments Climate Action Plan 2023,
- Project Ireland 2040 National Planning Framework,
- The Regional Spatial and Economic Strategy 2019-2031,
- The South Dublin County Development Plan 2022-2028,

(d) the documentation submitted with the application, including the Environmental Impact Assessment Report and the Schedule of Mitigation Measures (Appendix 2-1 of the Environmental Impact Assessment Report),

(e) the separation distances to houses and other sensitive receptors, and

(f) the design measures proposed for construction, operation, and decommissioning of the proposed development.

Appropriate Assessment Screening:

The Board agreed with and adopted the screening assessment and conclusion carried out in the Inspector's report that the proposed development individually or in combination with other plans or projects would not be likely to have a significant effect on any European Site, in view of the site's conservation objectives, and the submission of a Natura Impact Statement is not therefore, required.

Environmental Impact Assessment:

The Board completed, in compliance with section 172 of the Planning and Development Act 2000, as amended, an Environmental Impact Assessment of the proposed development, taking into account:

- the nature, scale, location, and extent of the proposed development,
- the Environmental Impact Assessment Report and associated documentation submitted with the application,
- the submissions made in the course of the application, and
- the planning Inspector's report.

The Board considered that the Environmental Impact Assessment Report, supported by the information submitted by the applicant, identifies and describes adequately the direct, indirect and cumulative effects of the proposed development on the environment. The Board is satisfied that the information contained in the Environmental Impact Assessment Report complies with the provisions of EU Directive 2014/52/EU amending Directive 2011/92/EU.

The Board agreed with the summary and examination, set out in the Inspector's report, of the information contained in the Environmental Impact Assessment Report and associated documentation submitted by the applicant and submissions made in the course of the application. The Board is satisfied that the Inspector's report sets out how these were addressed in the assessment and recommendation (including environmental conditions) and are incorporated into the Board's decision.

The Board completed an Environmental Impact Assessment in relation to the proposed development and concluded that, subject to the implementation of the mitigation measures proposed, as set out in Volume III – Appendix 2-1 of the Environmental Impact Assessment Report, and, subject to compliance with the conditions set out herein, the effects on the environment of the proposed development by itself and cumulatively with other development in the vicinity would be acceptable. In doing so, the Board adopted the report and conclusions of the Inspector.

Proper Planning and Sustainable Development

It is considered that, subject to compliance with the conditions set out below, the proposed development would be in accordance with national, regional, and local planning and related policy, would not have an unacceptable impact on landscape, ecology or cultural heritage, would not seriously injure residential amenities, would be acceptable in terms of traffic safety and would make a positive contribution to Irelands renewable energy commitments in relation to climate change. The proposed development would, therefore, be in accordance with the proper planning and sustainable development of the area.

CONDITIONS

1. The proposed development shall be carried out and completed in accordance with the plans and particulars lodged with the application, except as may otherwise be required in order to comply with the following conditions. Where such conditions require details to be agreed with the planning authority, the undertaker shall agree such details in writing with the planning authority prior to the commencement of development and the proposed development shall be carried out and completed in accordance with agreed particulars. In default of agreement, such matters shall be referred to An Bord Pleanála.

   Reason: In the interest of clarity.

2. The mitigation measures and monitoring commitments as set out in Appendix 2-1 Schedule of Mitigation Measures of the Environmental Impact Report shall be implemented in full.

   Reason: In the interest of clarity.

3. Prior to commencement of the development, a detailed Construction Environmental Management Plan (CEMP) for the construction phase shall be submitted to and agreed in writing with the planning authority, generally in accordance with the preliminary CEMP included in the Environmental Impact Assessment Report. The CEMP shall incorporate the following:

   (a) a detailed plan for the construction phase incorporating, inter alia, the construction programme, supervisory measures, noise, dust and surface water management measures, including appointment of a Site Noise Liaison Officer, construction hours and the management, transport and disposal of construction waste,

   (b) a comprehensive programme for the implementation of all monitoring commitments made in the planning application and supporting documentation during the construction period,

   (c) an emergency response plan, and

   (d) proposals in relation to public information and communication.

   A record of daily checks that the works are being undertaken in accordance with the Construction Environmental Management Plan shall be kept for inspection by the planning authority.

   Reason: In the interests of environmental protection and orderly development.

4. Surface drainage detail shall be submitted to the planning authority for agreement prior to the commencement of development. This shall include specific permissions for crossing water and drainage pipes with power ducts.

   Reason: In the interest of orderly development.

5. The undertaker shall facilitate the preservation, recording and protection of archaeological materials or features that may exist within the site. In this regard, the undertaker shall:

(a) notify the planning authority in writing at least four weeks prior to the commencement of any site operation (including hydrological and geotechnical investigations) relating to the proposed development,

(b) employ a suitably-qualified archaeologist who shall monitor all site investigations and other excavation works,

(c) provide arrangements, acceptable to the planning authority, for the recording and for the removal of any archaeological material which the planning authority considers appropriate to remove.

In default of agreement on any of these requirements, the matter shall be referred to An Bord Pleanála for determination.

Reason: In order to conserve the archaeological heritage of the site and to secure the preservation and protection of any remains that may exist within the site.

6. (a) Prior to the commencement of development, a revised roads layout should be submitted to the planning authority ensuring that no pedestrian crossings conflict with vehicular entrances.

(b) Prior to commencement of development a developed Construction Traffic Management Plan shall be agreed in writing with the planning authority. The report should include the traffic movements for the entire development including proposed development and the permitted development under previous planning application and concentrate on the traffic movements during the earthworks and stone capping layer phases. The agreed plan, along with the written agreement of the roads department shall be lodged to the planning authority. The written commitment of the undertaker to implement the agreed plan shall also be lodged to the planning authority.

Reason: In the interest of traffic safety.

7. Prior to the commencement of development, the applicant or developer shall enter into water supply and waste water connection agreement(s) with Uisce Éireann.

Reason: In the interests of environmental protection and public health.

8. Prior to commencement of development, the undertaker shall lodge with the planning authority a cash deposit, a bond of an insurance company, or such other security as may be acceptable to the planning authority, to secure the satisfactory reinstatement of the site on cessation of the project coupled with an agreement empowering the planning authority to apply such security or part thereof to such reinstatement. The form and amount of the security shall be as agreed between the planning authority and the undertaker or, in default of agreement, shall be referred to An Bord Pleanála for determination.

Reason: To ensure satisfactory reinstatement of the site.

Schedule of Costs

In accordance with the provisions of section 182B of the Planning and Development Act 2000, as amended, the amount due to be reimbursed to the applicant is **€84,462**

A breakdown of the Board's costs is set out in the attached Appendix 1.

Mick Long
Member of An Bord Pleanála
duly authorised to authenticate
the seal of the Board.

Dated this 25th **day of** March **2024**

An Bord Pleanála

Board Order – Appendix 1

ABP-317297-23

Strategic Infrastructure Development

Costs of determining the Application

Case Number: ABP-317297-23

Proposed Development: 110kV substation and grid connection, located at Profile Park, Baldonnell, Dublin 22.

Board Costs		
(1)	Cost (calculated based on Inspector's time) Inspector 1 (pre-application consultation) – €4,043 Inspector 2 (application) – €12,495	€16,538
(2)	Costs invoiced to Board	N/A
	Total chargeable costs	**€16,538**
Board Fees		
(3)	Application Fee – €100,000 Pre-application Consultation Fee – €1,000.00	€101,000
(4)	Observer fees paid	€0
	Total	**€101,000**
	Net amount due to be refunded to applicant	**€84,462**

Mick Long
Member of An Bord Pleanála
duly authorised to authenticate
the seal of the Board.

Dated this 25th **day of** March **2024**

An Bord Pleanála

Inspector's Report ABP-317297-23.

Development	110KV substation and grid connection.
Location	Profile Park, Baldonnell, Dublin 22.
Planning Authority	South Dublin County Council
Applicant(s)	Greener Ideas Limited.
Type of Application	Strategic Infrastructure.
Observer(s)	None
Date of Site Inspection	24th August 2023
Inspector	Philip Davis.

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1.0 Introduction

Planning approval is sought under the provisions of section 182A of the Act for the development of a 110kV Gas Insulated Switchgear (GIS) substation and associated Air Insulated Switchgear (AIS) compound on lands at Profile Park, Baldonnell. It includes a 110kV underground cable to a substation at Barnakyle. It is located within a new industrial estate now under rapid development approximately 1km north of Baldonnell Aerodrome just west of the R136 and south of the R134, west of Clondalkin.

An EIAR has been submitted with the application.

Submissions on the application were received from the planning authority, TII, DAU and EPA.

2.0 Site Location and Description

The proposed development is located within a newly developing industrial estate known as Profile Park, in the townland of Kilcarbery, County Dublin. This industrial estate is located south of the R134 link road between Newcastle and Clondalkin. The area is characterised by generally flat agricultural land, much of it developing for industrial uses – there is a large industrial complex north of the site, opposite the R134, with farmland and a golf course to the south and east. A series of link roads have been completed within the industrial estate linking up a number of industrial buildings either recently completed or under construction.

The main road link to the area is via the junction of the R136 and R134 east of the lands – the R136 providing links to the M4 and M7 motorways. Baldonnell Aerodrome is approximately 1km to the south.

3.0 Proposed Development

The proposed development consists of a 110kV electrical substation and associated grid connection to connect with the approved Profile Park Gas Fired Peaking Power Plant (**SD21A/0167**) and will comprise:

- An Eirgrid/ESBN Control Room building;

- Associated internal 15kV and 110kV underground cabling;
- Installation of a 15/110kV Transformer (TRAFO);
- 110kV underground cable to Barnakyle 110kV substation – 3 no. power ducts and 2 no. telecom ducts;
- Diesel generator;
- Security fencing, cameras and poles;
- Lights/lamp poles;
- Lightning masts; and
- Temporary construction compound.

4.0 Planning History

The applicant entered into pre-application consultation with ABP (**ABP-312984-22**). The Board confirmed that it was in the opinion that the proposed development falls within the scope of section 182A in a letter dated 4th April 2023.

There is a current appeal on a nearby site for a data centre (**ABP-317446-22**).

In June 2006 the Board granted permission for the West Dublin 220/110kV substation and associated works (**PL06S.VA0019**).

In April 2021 the Board decided to grant permission for A 110kV GIS substation building and 2 underground single circuit transmission lines within the Prospect Park estate (**ABP-308585.20**).

5.0 Policy Context

5.1. Development Plan

The site is within an area designated Objective EE '*to provide for enterprise and employment related uses*' in the South Dublin County Development (SCDD) Plan 2022-2028.

5.2. Natural Heritage Designations

The closest Natura 2000 site to the application site is some 5km north-west, the Rye Water Valley/Carton SAC, side code 003198 – this freshwater habitat is upriver of the site and not within its catchment. The Dublin Bay and River Tolka Estuary SPA, South Dublin Bay SAC and North Dublin Bay SAC are within 10km to the east, all within Dublin Bay. The site is within the overall Liffey catchment.

6.0 Submissions

6.1. South Dublin County Council

The proposed development is considered to meet all definitions within the Suth County Dublin Development Plan and is therefore considered acceptable in principle within the EE zoned lands.

- Noted that there are no protected structures, national monuments, or protected landscapes on or close to the site.
- Notes standard requirements for drainage – notes that Irish Water has no objection.
- Notes flood risk recommendations incorporated into the EIAR.
- Notes lack of detail on landscaping.
- Roads Division state that access and road capacity is acceptable.
- Concerns noted at concentration of electricity infrastructure within Profile Park, but principle of need is accepted.
- Proposed height is well below permitted maximum of 45 metres for aircraft safety.
- Accepts that ABP is competent authority for AA Screening.
- Standard details required for drainage, but permission needed from Irish Water for crossing existing sewers with power ducts.

6.2. Environmental Protection Agency

Notes apparent overlap with licensed site (power station). Noted that the license for this site may require updating in the light of the proposed development.

6.3. DoHLGH (DAU)

Requests conditions relating to standard monitoring of the works.

6.4. Transport Infrastructure Ireland

Acknowledges receipt of referral, requests that the Board abides by official policy with respect to national roads.

7.0 Applicants response

Notes DAU comment on submission and willing to accept conditions relating to archaeology.

Notes EPA comment – It is stated that at the proposed scale, the drainage infrastructure associated with the proposed development is not anticipated to affect the pending Industrial Emissions Licence Application. The applicant will correspond with the EPA on this point.

Notes TII submission, no response required.

8.0 Documentation submitted with the planning application.

The application has been submitted with an EIAR and an appropriate assessment screening, in addition to the required associated documentation. I will address the EIAR in detail in the relevant section below.

9.0 Planning Assessment

Most relevant planning considerations in this application are covered by the EIAR and AA screening. Apart from these issues, I consider that the main planning consideration is that of the overall policy context.

9.1. Policy context

The applicant sets out a detailed international, national, regional and local policy context for the proposed development in Section 6 of the EIAR Report. In addition there are a number of relevant non-statutory policies with regard to energy

infrastructure and climate change. In its overall context, I consider that its position within the policy context be seen as linked to the permitted peaking gas station the proposed development is intended to facilitate.

Key policy documents include:

Europe 2030 Climate and Energy framework and Renewable Energy Directive 2009/28/EC & 2018/2001/EU

The Framework and Directive sets out detailed requirements from members states for the achievements of overall increases in renewable energy and in the stabilization of national and international grid networks.

Climate Action Plan 2023

The Climate Action Plan 2023 (Chapter 12) notes that the electricity sector faces an immense challenge to meet its requirements under the sectoral emissions ceilings. Electricity will play an important role in the decarbonisation of other sectors through electrification, including transport, heating, and industry. Considerable progress has been made in decarbonising the electricity sector over the last decade, resulting in electricity emissions falling by 45% between 2005 and 2020. This was possible through the deployment of renewables and their successful integration into the power grid, and the increased use of higher-efficiency gas turbines.

Government set out its response to these challenges in the **National Energy Security Framework**, published in April 2022. This Framework details Government action to manage the impacts for energy users, ensuring continued security of supply, and reducing dependency on fossil fuels in the long term. It also highlights the work required in strengthening the grid to ensure a secure supply of electricity. Section 12.1.3 of the Plan notes that the rapid delivery of flexible gas generation is needed at scale and in a timeframe to replace emissions from coal and oil generation before the second carbon budget period.

Measures to meet the challenge include complete a revised version of ‘Shaping our Electricity Future’ to define the required new construction and reinforcement of the electricity transmission and distribution system across the country required to achieve sectoral ceilings and carbon budgets. The key performance indicators to delivery abatement in electricity include the provision of at least 2 GW of new flexible gas-fired generation by 2030. Actions for 2023 include ensure electricity generation grid connection policies and regular rounds of connection offers which

facilitate timely connecting of renewables, provides a locational signal and supports flexible technologies (Action number EL23/6).

National Planning Framework Ireland

The National Planning Framework outlines government support for the strengthening and reinforcement of the electricity transmission and distribution grids in Ireland. National Policy **Objective 47** seeks, in co-operation with relevant Departments in Northern Ireland, strengthen all-island energy infrastructure and interconnection capacity, including distribution and transmission networks to enhance security of electricity supply.

Objective 54 seeks to reduce our carbon footprint by integrating climate action into the planning system in support of national targets for climate policy mitigation and adaptation objectives, as well as targets for greenhouse gas emissions reductions.

Objective 55 promote renewable energy use and generation at appropriate locations within the built and natural environment to meet national objectives towards achieving a low carbon economy by 2050.

Objective 73(c) seeks to ensure that planning authorities and infrastructure delivery agencies will focus on the timely delivery of enabling infrastructure to priority zoned land in order to deliver planned growth and development.

Policy Statement on Security of Electricity Supply (November 2021)

Maintaining the security of electricity supply is considered a priority at national level and within the overarching EU policy framework in which the electricity market operates. It is expected that most renewable energy generated by 2030 will be from wind and solar. These sources of renewable energy are variable in nature and therefore will require other technologies to both support their operation and provide electricity supplies when they are not generating. This will require a combination of conventional generation (typically powered by natural gas), interconnection to other jurisdictions, demand flexibility and other technologies such as energy storage (e.g., batteries) and generation from renewable gases (e.g. biomethane and/or hydrogen produced from renewable sources). As more wind, solar, storage and interconnection is added to the system, conventional generation is expected to operate less, but sufficient conventional generation capacity will still be required. This conventional generation will spend much of its time in reserve for when needed – e.g., when required to balance the system in times of high demand and low

wind/solar generation. It is anticipated that natural gas will form the vast majority, and more enduring, part of this conventional generation.

The Government has approved that:

- the development of new conventional generation (including gas-fired and gasoil/distillate-fired generation) is a national priority and should be permitted and supported in order to ensure security of electricity supply and support the growth of renewable electricity generation;
- it is appropriate that existing conventional electricity generation capacity, including existing coal, heavy fuel oil and biomass fired generation, should be retained until the new conventional electricity generation capacity is developed in order to ensure security of electricity supply;
- the connection of large energy users to the electricity grid should take into account the potential impact on security of electricity supply and on the need to decarbonise the electricity grid;
- it is appropriate for additional electricity transmission and distribution grid infrastructure, electricity interconnection and electricity storage to be permitted and developed in order to support the growth of renewable energy and to support security of electricity supply;
- it is appropriate for additional natural gas transmission and distribution grid infrastructure to be permitted and developed in order to support security of electricity supply.

National Energy Security Framework (April 2022)

The National Energy Security Framework was prepared and adopted specifically in response to the situation in Ukraine and the implications for security of the EU and Irelands national energy security. The Framework notes that the level of dispatchable electricity generation capacity (i.e. capacity that does not rely on wind or solar energy) needs to increase significantly over the coming years due to reduced reliability of existing plants, anticipated new power stations not being developed as planned, expected strong growth in demand for electricity, and the closure of existing generation.

The Commission for Regulation of Utilities has statutory responsibility for ensuring security of electricity supply and is managing a programme of work to address this challenge which is being delivered in conjunction with the Department of the Environment, Climate and Communications and EirGrid.

It further notes that the continued supply of electricity to consumers in Ireland has not, to date, been impacted by the war in Ukraine. However, the situation is being monitored on a continuing basis by EirGrid. The level of dispatchable electricity generation capacity needs to increase significantly over the coming years in order to reliably meet the expected demand for electricity. The Commission for Regulation of Utilities, which has statutory responsibility for ensuring security of electricity supply, is managing a programme of work to address this challenge. This includes a programme of actions for the security of electricity supply. Chief amongst them in order to meet growing demand, replace retiring generators and support additional penetration of renewables, it is necessary to procure and deliver at least 2000MW of additional flexible gas-fired generation capacity by 2030 at the latest. This will be required in addition to procuring and delivering additional battery storage, low and zero-carbon system services, demand-side units and the delivery of additional interconnection capacity in the same period. Investment of this type, and at this scale, is critical to ensuring a secure transition and reaching the ambitious 2030 targets. EirGrid and the Department of the Environment, Climate and Communications are working closely with the Commission for Regulation of Utilities to implement this programme for work. The war in Ukraine and the potential for supply constraints has highlighted the need to urgently progress this work as a priority.

Regional Spatial and Economic Strategy for the Eastern and Midlands Regional Assembly

Chapter 10 of the RSES relates to infrastructure and section 10.3 relates to Energy. Its goal includes:

Support for the development of a safe, secure and reliable supply of electricity and the development of enhanced electricity networks as well as new transmission infrastructure projects that might be brought forward in the lifetime of this plan under EirGrid's (2017) Grid Development Strategy will serve the existing and future needs of the Region and strengthen all-island energy infrastructure and interconnection

capacity. The strategy goes on to note that the Dublin Region is the major load centre on the Irish electricity transmission system. Approximately one third of total demand is located in the Dublin Metropolitan Area, similarly the Eastern Region is a major load centre on the Irish transmission system. The main urban demand centres are composed of a mix of residential, commercial and industrial demand, which is expected to grow up to 2025 and beyond. Developing the grid in the Region will enable the transmission system to safely accommodate more diverse power flows from renewable generation and also to facilitate future growth in electricity demand. These developments will strengthen the grid 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.

RPO 10.20 seeks to support and facilitate the development of enhanced electricity and gas supplies, and associated networks, to serve the existing and future needs of the Region and facilitate new transmission infrastructure projects that might be brought forward in the lifetime of this Strategy. This Includes the delivery of the necessary integration of transmission network requirements to facilitate linkages of renewable energy proposals to the electricity and gas transmission grid in a sustainable and timely manner subject to appropriate environmental assessment and the planning process.

South Dublin County Council Development Plan 2022-2028

The site is within lands zoned EE 'to provide for enterprise and employment use'. Policy E1 is to respond to European, National and Regional Policy and legislation on climate action and energy. Policy EDE1 is described as the overarching policy to support sustainable enterprise and employment growth in the county area. Policy IE6 on electricity infrastructure states that it is policy to:

> *Protect the existing electricity infrastructure and support the development of a safe, secure and reliable supply of electricity and the development of enhanced electricity networks as well as new transmission infrastructure projects subject to the relevant environmental assessments.*

Other plans and policies

A number of other relevant non-statutory policies and projects are outlined in the submission documents, including the EirGrid DS2 programme, aimed at ensuring a

stable grid, Eirgrids Strategy 2020-25, and East Coast Generation Opportunity Assessment, and the 'Shaping our Electricity Future Roadmap (2021).

9.1.1. **Conclusions**

In overall terms, the site is within an existing zoned and permitted industrial and employment area, and the provision of additional energy infrastructure is in accordance with all levels of EU, national and regional policy, including non-statutory policy relating the grid development. This type of development is generally considered acceptable within such EE zoned areas. I would conclude that the proposed development is in accordance with stated policy and the local development plan and related policies.

9.1.2. **Other planning issues:**

The site is within a permitted industrial and commercial area and is consistent with previous Board decisions relating to electricity infrastructure in the area. The industrial estate is well served with internal link roads to the regional road network so no traffic issues apply. There are no dwellings close to the site. There are no protected structures or other Development Plan designations of specific relevance to the proposed development.

I note comments from the planning authority and other statutory bodies with regard to additional standard conditions/details required for the finish/landscaping of the site, archaeology, and drainage. I consider that these can be dealt with by way of standard conditions.

I therefore conclude that all relevant planning considerations are satisfied and have been addressed within the context of the EIAR (assessment below).

10.0 **EIAR**

I have carried out an examination of the information presented by the applicant, including the EIAR. A summary of the issues is at the is set out in this report – no submissions have been made – the Board issued its determination on the 4th April 2023 with a list of prescribed bodies – none have made submissions on the EIA.

Although no issues were raised in the course of the EIAR process, I consider that the main issues raised specific to EIA can be summarised as follows:

- the effect of construction emissions on human health.
- the potential impact of the clearance operations on local watercourses.

These issues are addressed below under the relevant headings, and as appropriate in the reasoned conclusion and recommendation, including conditions.

I am satisfied that the EIAR has been prepared by competent experts to ensure its completeness and quality, and that the information contained in the EIAR and supplementary information provided by the developer, adequately identifies and describes the direct, indirect and cumulative effects of the proposed development on the environment and complies with article 94 of the Planning and Development Regulations 2000, as amended.

10.1. Overview of the development.

The proposed development is as described in Section 3 above. The 110kV substation is proposed to provide a connection from the adjacent gas peaking power plant to the existing electricity transmission system – electricity is to be transported to the existing Barnakyle 110kV station – these are underground cables. The gas peaking plant is to operate during periods of high electricity demand or when there are particularly low renewable energy inputs.

There is a temporary construction compound to be provided 185 metres to the south-east – this is on cleared land within Profile Park. The entire site is within a permitted commercial industrial development and all the lands have been recently cleared, with service roads provided.

10.2. Population and Human health

Section 7 of the EIAR outlines impacts on human health. It includes desktop studies of the local population, employment status, tourism and known human health data. Section 7.3.11 provides an overview of land use and community facilities in the wider area. It is noted on the basis of the 2022 Census results that there is a

significant increase in population in the general area. 130 no. property receptors (i.e. homes) were identified within 1km of the site, indicated in Figure 7-2 of the EIAR.

Under a do-nothing scenario, it is indicated that the existing lands would remain unchanged as a greenfield site. It is anticipated that that any impacts on the local population would be slight and short term due to the construction activities. No impacts on property values are anticipated, but it is anticipated that the construction of the works would have a short-term slightly positive effect on employment and economy in the local area. It is not considered that there would be any effects on identified tourism attractions or amenities in the wider area, including the Grange Castle Golf Course or the Dublin Mountains Park. It is anticipated that no significant effects would arise from the operational period of the works. During decommissioning, standard provisions would be made for demolition and removal of materials.

With regard to human health, dust and noise emissions during construction are likely the main impactor. No significant effects are anticipated due to the scale of the works and the distance from receptors. No specific mitigation measures beyond normal best practice are recommended. It is noted that the overall proposed development is to facilitate renewable energy in the State and as such should have an overall decrease on air pollution due to the phasing out of coal, gas and peat burning stations.

It is not anticipated that there would be impacts on residential amenity due to the distance from any receptors.

Chapter 11 addresses noise and vibration, with particular reference to its impact on human health and amenity. It is concluded that the impacts would be short term (construction), with long term but imperceptible operational noise, both mostly arising from traffic generation. It is not considered that noise or vibration impacts would cause significant effects.

The EIAR does not recommend any specific mitigation measures for any of the phases of the proposed development although general measures (including a CEMP) are set out in Appendix 2-1 (Schedule of Mitigation Measures). It is not considered that there would be any cumulative effects. It is concluded that there would be slight to positive residual effects due to facilitating overall national policy on energy.

Conclusions

I am satisfied that the EIAR has adequately addressed all significant effects on population and human health. The proposed development is a relatively small scale development within an commercial area with no sensitive receptors nearby. As such, I concur with the overall conclusions of the EIAR as set out in Section 7.8 of the Report. In itself, and with regard to cumulative, direct, and indirect effects, I would conclude that no specific conditions are required above a standard condition relating to the need for the local authority to confirm any specific construction details outlined in the Appendix 2-1 schedule.

10.3. Biodiversity

Section 12 of the EIAR sets out anticipated effects on biodiversity. The overall baseline and field survey work and the zone of impact are outlined – no comments were received from the consultations set out in section 12.3.2.2. All desktop and field studies were carried out in accordance with EU and national guidelines. Several other ecological assessments in the area associated with other planning applications are also used to establish the baseline (section 12.5.1.10).

Table 12.3 sets out all designated sites of importance in the wider area. None are identified on or close to the site – there are no sites of identified conservation issues within 5km of the study area with the exception of the Grand Canal pNHA some 1.6km to the north (no hydraulic connection). A plan of all identified sties is set out in Figure 12.1. Bird reports from within 2 km of the site are set out in Table 12.4. A bat survey was carried out showing no evidence of presence – I note there are no structures or habitats on the site likely to be suitable for bat roosting or nesting.

The field survey indicates that all the site is a general mosaic of wet grassland, bare ground, grassy verges and artificial surfaces. Some hedgerow and treelines are identified along the boundary of the construction compound, with the Baldonnell Stream the only watercourse in the area – some 120 metres to the east. This watercourse has a slow flow with no evidence of otter, although kingfisher have previously been recorded downstream. An overgrown dry drainage ditch was also surveyed along the construction site boundary. A habitats map is provided in figure 12.2.

Section 12.6 addresses impacts. It is noted that the do-nothing option would result in the existing habitats remaining and would recolonise naturally. The AA report is referred to with regard to European sites – no effects are identified. There are a number of pNHA's within 15km, due to no significant water impacts being identified, no effects are indicated for any of these.

It is indicated that the loss of habitat (2.6 hectares) would be permanent, and an imperceptible and negative effect – none of the identified habitats are of any significance. Some slight, short term slight negative effects are identified during construction on watercourses. The possibility of common frog in the Baldonnell Stream is indicated as a potential for short term, slight negative effects on fish and aquatic species via water quality degradation.

Construction impacts would result in a number of short term, slight negative impacts due to dust and impacts on water. A slightly medium term negative effect due to possible dispersion of invasive plant species is identified.

It is noted that there is no evidence of otter habitat in the area, with the possibility of some other mammals in the hedgerow and grassland, but none like to be significant. The loss of grassland would have a permanent, imperceptible negative effect on local bird populations. Any impact from disturbance, displacement on birds would be short term and imperceptible.

Mitigation measures are set out in 12.7. All are standard best practice measures during such works, with particular emphasis on the prevention of spillage to the watercourses and not carrying out works during the nesting season where appropriate. Other permitted projects in the area are assessed with regard to cumulative impacts.

Section 12.9 addresses residual effects – it is concluded that there would be no significant residual effects from any of the three phases (construction/ operation/decommissioning).

Conclusions

The EIAR anticipates no residual effects and otherwise minor and short term to medium term effects from the proposed development, and no significant indirect or cumulative effects.

The proposed development takes up zoned land within a commercial area – available habitat is disturbed grassland, bare ground and hard surfacing. There are no sensitive ecological sites nearby, with the one watercourse and some low-grade hedgerow.

As such I concur with the conclusion that there would be no significant negative effect on biodiversity and I do not recommend any further conditions with regard to this.

10.4. **Land, soil, water and climate**

These elements are addressed in sections 8.0, 9.0 and 10.0 of the report.

Section 8 addresses, lands, soils and geology. The methodology included desk top studies and a walk over survey of the site. The site is indicated as being on deep poorly drained mineral soils with no record of flooding. The bedrock is Lucan Formation limestone. There was no indication from the survey or desktop survey of soil contamination, site of geological heritage, or geohazards.

The potential effects are indicated as soil removal and excavations, with some replacement of topsoil. The excavation works are indicated as having an imperceptible, temporary effect on soils and geology. The various anticipated impacts are set out in summary in section 8.4.5. Standard mitigation measures are set out for the storage and management of materials and the prevention of spillages or accidents. It is concluded that there would be no indirect or cumulative impacts on land and soil, and it will not have a significant negative effect.

Section 9.0 addresses hydrology and hydrogeology. The study involves desk studies of information of the site and a site walkover. The site topography is mostly flat, with no watercourses on the site or within 100 metres, but the Baldonnell Stream is within the overall landholding. It is within the Liffey catchment. Minor surface water ponding occurs on the site, but there is no evidence for pluvial, groundwater or tidal flood risk. It is indicated that the development would have an imperceptible impact on flood risk downstream of the subject site and the development satisfies the criteria for the PSFR Justification test. Surface water quality of the nearby stream is indicated as moderately polluted or poor according to EPA monitoring.

The type overlies a locally important aquifer, moderately productive in local zones. It is considered that the subsoil is low permeability limestone till and not considered to represent an aquifer body. No karst features were observed or recorded in the site. No public water scheme is present within 2 km of the site. Groundwater flow is likely to be generally in the direction of the Liffey.

Suspended solids from incorrect stockpiling and removal of subsoil and topsoil is indicated as a possible source of pollution to watercourses – measures to address this are set out in Section 9.3.4.3.

During the operational phase it is indicated that appropriate containment, use and disposal of chemicals on site would be required to prevent pollution discharges, and firefighting systems would be required – in the event of an accident, water pollution is a likely and permanent effect. Decommissioning impact is likely to be significant,

long term and likely to impact on surface water, in the absence of appropriate measures (these are set out in Appendix 2-1). The magnitude criteria for impacts on water are set out in Tables 9-6 to 9-8.

The report concludes that the overall residual impacts on the surrounding water quality, hydrology, hydrogeology and existing drainage regime at the site are considered to be not significant and mainly short term in nature. No significant cumulative impacts on any of the regional surface water catchments or groundwater bodies are anticipated.

With regard to air quality and climate, Section 10 sets out baseline survey information and the context for assessing climate change impacts. It is considered that dust arisings from construction and decommissioning would be the major contributor to air pollution, while emissions during construction would impact on greenhouse gas emissions. The immediate environment is not considered particularly sensitive to dust arising due to the nature of the immediate area (no dwellings and no sites of particular ecological sensitivity). Standard measures are proposed to minimise dust arisings and other air pollutants. It is concluded that impacts will be negative, short term, but largely imperceptible.

Conclusions

The site and immediate areas are not particularly sensitive with regard to any impacts on land, soil and water. The EIAR sets out tables of standard control measures for controlling water emissions and preventing undue impacts on soils and geology. I am satisfied that the area is not prone to flooding and the works would not create any additional downstream flood risk. The area is robust with regard to impacts on geology and hydrogeology, so no significant effects can be anticipated that would require additional mitigation or other controls over and above normal best practice. I note that the planning authority requested conditions relating to drainage arrangements for the site – I consider that these are reasonable but do not invalidate the overall conclusions of the EIAR with regard to surface water impacts.

10.5. Material assets, cultural heritage and the landscape

The EIAR anticipates that negative impacts on material assets will be minor and short term, mostly due to interference with other land-users during construction and the laying of cable. The overall development is intended to enhance the national grid, so the residual effects are anticipated to be positive, slight and permanent.

Chapter 13 sets out predicted impacts on cultural heritage, setting out the legislative context and baseline information. A significant number of earlier reports on archaeological remains in the area have been conducted as part of other developments (section 13.3.2). Cartographical analysis of the site and immediate areas show it was always agricultural lands in recent centuries. A field inspection of the site was carried out.

It is noted that there is no evidence of archaeological remains on or near the site, nor any evidence of previous use of the site. Much of the lands have been disturbed. No mitigation above normal monitoring is required. It is concluded that there are no cumulative effects and no significant residual impacts.

I note the comments from the Development Applications Unit requesting a monitoring condition – the applicant did not object to this. I do not consider that this request invalidates the conclusions in this regard of the application.

Chapter 14 addresses landscape and townscape assessment. The methodology involved an assessment of the character of the area in line with guidance. The study area involved a 1-km radius (set out in Figure 14.1). The area is noted to be flat and dominated by modern peri-urban industrial commercial uses. The Landscape Character Assessment for SDCC is summarised, noting the overall wider context (in addition to the policy context for such areas in the Development Plan). Visual assessment photomontages are provided in Appendix 14.1 of the EIAR.

In its assessment of impacts, it is noted that the site is within an existing industrial and commercial area, and thus there would be a neutral impact in the ‘do nothing’ scenario. The impacts of both construction and operation are considered to be

slight, neutral to negative and imperceptible. The decommissioning stage would be neutral and temporary.

Conclusions

The proposed development is within a permitted industrial estate – there is no evidence on file or from available sources that there are any archaeological sites or other sites of cultural/historical importance on or close to it. There are no protected structures within the vicinity. The landscape is flat and primarily commercial/ industrial in nature. The EIAR concludes that any impacts would be generally neutral or minor and I would concur with this – the design of the apparatus and the land use are appropriate for the location.

I do not recommend any additional conditions or mitigation beyond standard ones relating to the finish and materials and to a standard monitoring of the site for archaeological remains.

10.6. **The interaction between the above factors**

Chapter 16 sets out anticipated interactions between the above factors. It concludes that the primary interactions are between human health and the visual perceptions, noise, air quality and biodiversity. It is determined that no amplification effect beyond those noted in the previous sections is anticipated.

Conclusions

I concur with the overall conclusion of Chapter 16 that the anticipated effects are not serious and apart from the interactions identified specifically within the relevant sections there are no likely negative effects, direct, indirect or cumulative, likely to arise from interactions.

10.7. **Reasoned Conclusion**

Having regard to the examination of environmental information contained above, and in particular to the EIAR and supplementary information provided by the developer, and the submissions made in the course of the application I conclude

that there are no environmental effects above and beyond those projected by the applicants in the EIAR that can be reasonably anticipated. The proposed development, including the construction site, are an appropriate land use within an industrial/commercial zone and there are no sensitive receptors in the area and the overall environment is robust. The proposal is subject to normal best practice requirements which will adequately address identified risks in construction, operation and decommissioning.

Having regard to the examination of environmental information contained above, and in particular to the EIAR and supplementary information provided by the developer, I consider that the main significant direct and indirect effects of the proposed development on the environment will be mitigated by way of the Mitigation measures set out in Appendix 2-1 of Volume III of the EIAR as submitted.
I am, therefore, satisfied that the proposed development would not have any unacceptable direct or indirect effects on the environment.

I am satisfied that the EIAR has been prepared by competent experts to ensure its completeness and quality, and that the information contained in the EIAR and supplementary information provided by the developer, adequately identifies and describes the direct, indirect and cumulative effects of the proposed development on the environment and complies with article 94 of the Planning and Development Regulations 2000, as amended.

11.0 **Appropriate Assessment**

The applicant has submitted a screening report for Appropriate Assessment / Natura Impact Statement as part of the planning application dated June 2023, provided by Tobin Building Consultants.

This report sets out all relevant guidance documentation and relevant court judgements (section 3.1), and notes that the EPA, DAU, An Taisce and Inland Fisheries Ireland (IFI) were consulted, with no responses received. Section 3.3 outlines the desktop studies and information sources. An ecological survey of the

site was undertaken in January 2023. The limitations of a January survey for some species is noted, but given the nature of the site this was not considered to invalidate any solutions. As the site is within a developing industrial estate and in an area under intense construction and having regard to the lack of proximity of any designated habitats, I consider this to be reasonable.

The Screening document notes the nature and extent of the site, along with plans showing the extent of the site. A brief overview of the nature of the works, including pre-construction works is provided.

The results of the survey are set out – it is noted that the site has recently been largely cleared of habitat and comprises a mosaic of spoil and bare ground. Much of the site is tarmacadam and concrete verges, with dry meadow within the proposed construction compound.

It is noted that the Baldonnell Stream is located 125 metres east of the site. This flows to the Grifeen River, which in turn discharges to the Liffey. An otter survey of the watercourse was undertaken and none were detected – it is not considered suitable habitat. In addition, there is no suitable nesting habitat for kingfisher close to the site. No other protected fauna were detected. The lands are located over the 'Dublin Groundwater Body', which is assigned 'good' WFD status.

It is stated that no European sites are located within or adjacent to the proposed development site. The closest site is the **Rye Water Valley/Carton SAC** (site code 001398), some 6km northwest. The site is hydrologically connected to four European sites in Dublin Bay – **North Dublin Bay SAC** (000206); **South Dublin Bay SAC** (000210), **North Bull Island SPA** (004006); and **South Dublin Bay and River Tolka Estuary SPA** (004024). Figure 6-1 indicates the relationship between the site and these designated areas.

Section 6 provides an overview of the construction, operational, and decommissioning impacts. This is largely consisting of ground disturbance, and

dust/noise and other arisings from construction and from compound lighting. In its assessment of significance, it is noted that the potential hydrological pathway was identified between the site and four EU designated sites within Dublin Bay. It concludes that there are no significant effects on the qualifying interests/special conservation interests of these four sites due to:

1. The small scale and short term nature of the works;
2. Lack of instream works proposed for the Baldonnell Stream;
3. The separation distance between the proposed development and Baldonnell Stream; and
4. The significant distance from the designated sites and the proposed development.

The potential for in-combination effects was addressed in Section 8. A number of nearly development sites are identified, but it is considered that these are minor in nature and have no potential indirect/in-combination effects. With regards to plans, it is noted that the SDDP 2022-2028 indicates that the site is within Enterprise and Employment zoned lands.

The Screening Assessment concludes that the proposed development will not result in likely significant effects on the qualifying interests of any European sites and so a Stage 2 Appropriate Assessment is not required.

I am satisfied that the applicant's **Stage 1 AA Screening Report** was prepared in line with current best practice guidance and provides a description of the proposed development and identifies European Sites within a possible zone of influence of the development.

The applicants AA Screening Report concluded that the proposed development will not result in likely significant effects on the qualifying interests of any European sites and so a Stage 2 Appropriate Assessment is not required. Having reviewed the documents, submissions, and surveyed the site, I am satisfied that the information

allows for a complete examination and identification of any potential significant effects of the development, alone, or in combination with other plans and projects on European sites. I am satisfied that the surveys, assessment, and conclusions are consistent with all information on file and my observations during the site visit, in addition to other information provided with the application to the Board.

The proposed development was considered in light of the requirements of Section 177U of the Planning and Development Act 2000 as amended. Having carried out Screening for Appropriate Assessment, it has been concluded that the proposed development individually or in combination with other plans or projects would not be likely to have a significant effect on European Site No. 001398; 000206; 00021; 004006; or 004024 or any other European site, in view of the site's Conservation Objectives, and Appropriate Assessment (and submission of a NIS) is not therefore required.

This determination is based on the following:

- The size and scale of the proposed development
- The nature of the site and its location within an industrial estate zoned for Enterprise and Employment
- The separation distance from any nearby watercourse providing a direct hydrological link to the designated habitats in Dublin Bay.
- The absence of any evidence of habitat or fauna on the site or in the vicinity that could support species associated with any designated habitats.

12.0 **Recommendation**

I recommend that the Board grant permission for the proposed development for the reasons and considerations set out below.

13.0 **Reasons and Considerations**

In coming to its decision, the Board had regard to the following:

- The nature, location, scale and extent of the proposed development
- The characteristics of the site and its general vicinity,
- European, national, regional and county level support for facilitating the improvement and stability of the national and local grid as set out in documents such as:
- The Governments Climate Action Plan 2023,
- Project Ireland 20-40 National Planning Framework
- The Regional Spatial and Economic Strategy 2019-2031,
- The South Dublin County Development Plan 2022-2028
- The documentation submitted with the application, including the EIAR and the Schedule of Mitigation Measures (Appendix 2-1 of the EIAR),
- The separation distances to houses and other sensitive receptors,
- The design measures proposed for construction, operation, and decommissioning of the proposed development.

It is considered that, subject to compliance with the conditions set out below, the proposed development would be in accordance with national, regional, and local planning and related policy, would not have an unacceptable impact on landscape, ecology or cultural heritage, would not seriously injure residential amenities, would be acceptable in terms of traffic safety and would make a positive contribution to Irelands renewable energy commitments in relation to climate change. The proposed development would, therefore, be in accordance with the proper planning and sustainable development of the area.

14.0 **Conditions**

1. The proposed development shall be carried out and completed in accordance with the plans and particulars lodged with the application, except as may otherwise be required in order to comply with the following conditions. Where such conditions require details to be agreed with the planning authority, the undertaker shall agree such details in writing with the planning authority prior to the commencement of development and the proposed development shall be carried out and completed in accordance with agreed particulars. In default of agreement, such matters shall be referred to An Bord Pleanála.

   Reason: In the interest of clarity.

2. For the avoidance of doubt, all mitigation measures as set out in Appendix 2-1 Schedule of Mitigation Measures, dated June 2023 shall be implemented. All details of the proposed CEMP shall be agreed and confirmed with the planning authority prior to the commencement of development.

   Reason: In the interest of clarity.

3. All external finishes, including material types and colouring, shall be submitted to the planning authority for agreement prior to the commencement of development.

   Reason: In the interest of visual amenity.

4. Surface drainage detail shall be submitted to the planning authority for agreement prior to the commencement of development. This shall include specific permissions for crossing water and drainage pipes with power ducts.

   Reason: In the interest of orderly development.

5. The developer shall facilitate the preservation, recording and protection of archaeological materials or features that may exist within the site. In this regard, the developer shall -

   (a) notify the planning authority in writing at least four weeks prior to the

commencement of any site operation (including hydrological and geotechnical investigations) relating to the proposed development,

(b) employ a suitably-qualified archaeologist who shall monitor all site investigations and other excavation works, and

(c) provide arrangements, acceptable to the planning authority, for the recording and for the removal of any archaeological material which the authority considers appropriate to remove.

In default of agreement on any of these requirements, the matter shall be referred to An Bord Pleanála for determination.

Reason: In order to conserve the archaeological heritage of the site and to secure the preservation and protection of any remains that may exist within the site.

EIAR

The Board completed in compliance with s.172 of the Planning and Development Act 2000 an environmental impact assessment of the proposed development, taking into account:

- the nature, scale, location, and extent of the proposed development;
- the Environmental Impact Assessment Report and associated documentation submitted with the application;
- the submissions from [the applicant, the appellant(s), the planning authority, the observers and the prescribed bodies], [including submissions made to the oral hearing];
- the Planning Inspector's report;

The Board considered that the Environmental Impact Assessment Report, supported by the information submitted by the applicant identifies and describes adequately the direct, indirect and cumulative effects of the proposed development on the environment. The Board is satisfied that the information contained in the

EIAR complies with the provisions of EU Directive 2014/52/EU amending Directive 2011/92/EU.

The Board agreed with the summary and examination, set out in the Inspector's report, of the information contained in the Environmental Impact Assessment Report and associated documentation submitted by the applicant and submissions made in the course of the application. The Board is satisfied that the Inspector's report sets out how these were addressed in the assessment and recommendation (including environmental conditions) and are incorporated into the Board's decision.

The Board completed an environmental impact assessment in relation to the proposed development and concluded that, subject to the implementation of the mitigation measures proposed, as set out in Volume III – Appendix 2-1 of the EIAR, and, subject to compliance with the conditions set out herein, the effects on the environment of the proposed development by itself and cumulatively with other development in the vicinity would be acceptable. In doing so, the Board adopted the report and conclusions of the reporting inspector.

Philip Davis
Planning Inspector

30th November 2023

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BALDONNELL 110KV SUBSTATION

ENVIRONMENTAL IMPACT ASSESSMENT REPORT (EIAR)

VOLUME I – NON TECHNICAL SUMMARY

June 2023

BALDONNELL 110KV SUBSTATION

ENVIRONMENTAL IMPACT ASSESSMENT REPORT – VOLUME I

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1.0 INTRODUCTION

1.1 BACKGROUND

Greener Ideas Limited is proposing to construct a 110kV electrical substation (hereafter referred to as the "Baldonnel Substation") and associated grid connection at a site located in Profile Park, Dublin 22. The proposed substation is being developed to provide a connection for the adjacent gas fired power plant to the existing electricity transmission system. The gas fired power plant will have a capacity to generate up to 102MW of electricity.

Electrical power will be exported from the power plant's main transformers through the proposed Baldonnel Substation to the existing Barnakyle 110kV substation, which is operated by EirGrid and owned by ESB. The associated grid connection works will consist of underground cabling.

The associated gas fired peaking power plant will operate when electricity demand is higher than average, typically during morning and evening peak usage times. The plant will regularise energy provision in the electricity grid especially in the context of an increase in use of renewable energy technologies, such as wind and solar power. The plant technology allows the delivery of an efficient, safe and secure electricity system by helping to manage fluctuating electricity demands and compensate for shortages occurring from wind or solar power. This will accommodate and support Ireland's transition to a low-carbon economy and mean that Ireland can continue to invest in renewable sources of power in order to meet future national and EU targets. The design of the plant and its ultimate usage is flexible such that it may provide power directly to the national electricity grid. Natural gas, supplied from the Gas Networks Ireland national grid, will be the primary fuel source for the plant.

An Environmental Impact Assessment (EIA) Report has been prepared in order to inform the planning application for the proposed Baldonnell Substation, which has been submitted to An Bord Pleanála for statutory approval. It should be noted that the application seeks a 10 year planning permission.

1.2 THE APPLICANT

Greener Ideas Limited (GIL) is a joint venture company comprising of Bord Gáis Energy and Mountside Properties Limited. GIL is developing a portfolio of energy projects and has secured planning permission for gas fired power plants and battery energy storage plants in Kilkenny, Tipperary and Roscommon. It is envisaged that these plants will make a significant contribution towards Irelands renewable energy targets for 2030 and beyond as they will help regularise the electricity grid and facilitate additional renewables integration onto the grid in line with EirGrid's DS3 Programme (refer Section 4.4.1).

Bord Gáis Energy (BGE) has been in operation in Ireland since 1976. Today, BGE provides gas, electricity and home care services to over 730,000 residential and business customers throughout the country. It operates the 445 MW Combined Cycle Gas Turbine (CCGT) power plant in Whitegate, County Cork. BGE's sustainable principles include:

- To provide products and services to customers that support a low carbon future;
- To support the creation of a sustainable low carbon energy system for Ireland; and
- To strive for a net zero internal carbon footprint from our own corporate operations.

In 2014, BGE became part of the global Centrica plc Group. Centrica is a leading international energy services and solutions provider. Centrica supplies energy and services to over 26.2 million customer accounts mainly in Ireland, the UK and North America through its brands including BGE, British Gas and others.

Mountside Properties Limited are shareholders in the operation of the 400 MW CCGT power plant in Tynagh, County Galway.

1.3 SITE LOCATION

The site of the proposed Baldonnell Substation is located in Profile Park, Dublin 22. This is a 100 acre (40.5 Ha) fully enclosed, private business park which has been developed to the highest of standards. It is easily accessible from the major arterial roads in the city including the M50, M7 and M4, and is served by excellent public transport links.

Within Profile Park the proposed substation will be located on greenfield lands immediately adjacent to the associated gas fired power plant, and near to the existing Digital Realty data centre. The proposed Kilcarbery Substation will be located along the western boundary of the proposed Baldonnell Substation site.

The site of the proposed substation has been identified by South Dublin County Council in its County Development Plan 2022-2028 as Zoning Objective 'EE' which is 'To provide for enterprise and employment related uses'. The siting of a power plant and proposed substation together in Profile Park would bring additional opportunity to further accommodate data centre development. In this context it should be noted that Profile Park is connected directly onto the Dublin metropolitan fibre network called the T50. The T50 is a multi-duct fibre carrying system which extends over 44 km and provides connectivity to 24 business parks and from these into the global networks through.

Existing tenants within Profile Park and the surrounding business and enterprise parks include Google, Microsoft, Digital Realty Trust, Telecity and others. Immediately adjacent to Profile Park is the Castlebaggot 110 / 220 kV substation which provides electrical transmission connectivity to the national electricity transmission grid system.

The nearest residential properties are located some 400m to the south of the site and some 450 m to the north east. Grange Castle Golf Course is located approximately 120m east of the site and Baldonnell Aerodrome 450m south of the site.

The proximity to the transmission grid, natural gas connections and local data centre development are key drivers for the siting of the gas fired power plant and associated proposed substation.

1.4 LAND OWNERSHIP

Greener Ideas Ltd. is the owner of the site on which the proposed substation will be located, with different ownership titles for the grid connection route.

Documentary evidence in relation to the owner's consent for the submission of the planning application for the proposed development to An Bord Pleanála has been provided with the planning application documentation.

2.0 EIA REPORT METHODOLOGY

2.1 INTRODUCTION

This chapter presents an outline of the methodology to be employed for the proposed Baldonnell Substation. It outlines the methodology for the identification and evaluation of potential likely significant environmental effects and also presents the methodology for the identification and evaluation of potential cumulative and interrelated impacts.

As set out in Chapter 1 (Introduction), the proposed substation is being developed to provide a connection for the adjacent gas fired power plant to the existing electricity transmission system. The gas fired power plant will have a capacity to generate up to 102MW of electricity.

2.2 REQUIREMENT FOR ENVIRONMENTAL IMPACT ASSESSMENT

2.2.1 EIA Directive Context

The primary objective of the of the Environmental Impact Assessment Directive (Council Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment as amended by Directive 2014/52/EU'(EIA Directive), is to ensure a high level of protection of the environment and human health, through the establishment of minimum requirements for environmental impact assessment (EIA), prior to development consent being awarded, of public and private developments that are likely to have significant effects on the environment.

Directive 2014/52/EU provides a definition of environmental impact assessment as being a process consisting of:

- The preparation of an environmental impact assessment report (EIAR);
- The carrying out of consultations required to inform the EIAR;
- The examination by the competent authority of the information presented in the EIAR and any supplementary information provided, where necessary, by the developer and relevant information received through consultations with the public, prescribed bodies and any affected Member States;
- The reasoned conclusion by the competent authority on the significant effects of the project on the environment; and
- The integration of the competent authority's reasoned conclusion into any development consent decision.

The EIA Directive is transposed into Irish legislation via European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 and the Planning and Development Acts and Regulations 2000 to 2021.

2.2.2 EIA and Planning Legislation in Ireland

In determining the requirement for EIA, the Directive and its transposing legislation in Ireland differentiates between the projects that always require EIA and those for which an EIA may be required. These projects are listed in Schedule 5 Part 1 and Part 2 of the Planning and Development Regulations 2001, as amended (hereafter referred to as 'the Panning Regulations').

Schedule 5, Part 1 Projects, are projects which are considered as having significant effects on the environment and require an automatic EIA.

Schedule 5, Part 2 Projects, are projects where national authorities have to decide whether an EIA is needed. This is done by the "screening procedure", which determines the effects of projects on the basis of thresholds/criteria or a case-by-case examination. The projects listed in Part 2 are in general those not included in Part 1 which may be considered to have a lesser environmental impact.

2.2.3 EIA Screening

An Environmental Impact Assessment (EIA) Report was prepared in order to inform the planning application for the associated gas fired power plant (Reg, Ref.: SD21A/0137). This received planning approval from South Dublin County Council on the 19th July 2022. It should be noted that the application sought a 10-year planning permission. The EIA Report was also prepared in support of Industrial Emissions license application to the Environmental Protection Agency.

In the context of the gas fired power plant, the most relevant project type identified in Schedule 5 is Part 1 Paragraph 2(a) which relates to:

> *'A thermal power station or other combustion installation with a heat output of 300 megawatts or more.*

The power plant will have a capacity to generate up to 102MW of electricity. This heat output is substantially lower than the 300 MW threshold identified in Paragraph 2(a) and so therefore an automatic EIA was not required. However, on the basis of discussions with South Dublin County Council and on a precautionary basis also having regard to other power plant projects in the Council area, it was agreed to prepare an EIA Report in support of the planning application.

By association, an EIAR has been prepared to inform the planning application for the proposed Baldonnell Substation.

2.3 EIA GUIDANCE

The EIA Report methodology draws upon a number of EIA principles, regulations and guidance documents, including:

- Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, May 2022);
- Draft Guidelines on the Information to be contained in Environmental Impact Statements (EPA, September 2015);
- Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, August 2017);
- Draft Advice Notes on Preparing Environmental Impact Statements" (EPA, September 2015);
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (DHPLG, 2018);
- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017);
- Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment, (European Commission, 2013); and
- Receptor specific guidance documents (e.g. Ecological Impact Assessment (EcIA) guidance issued by the Chartered Institute of Ecology and Environmental Management (CIEEM).

2.4 EIA REPORT CONSULTATIONS

The EIA Report Scoping and consultation activities were carried out in accordance with all relevant guidance documents as set out in Section 2.3.

Scoping is a process of deciding what information should be contained in an EIAR and what methods should be used to gather and assess that information. The purpose of scoping for the EIAR is to provide a framework for the approach to be taken by the individual specialists in carrying out their evaluations, identifying environmental aspects for which potential significant environmental impacts may arise. It also provides a framework for the consultation process and sets out the intended structure of the Final EIAR.

2.4.1 Consultation with An Bord Pleanála

A pre-application consultation meeting was held with An Bord Pleanála on the 5th May 2022 under section 182E of the Planning and Development Act 2000, as amended (Ref: ABP-312984-22).The purpose of the meeting was to initiate the consultation process to determine if the proposed development falls within the scope of section 182A of the Planning and Development Act, 2000 as amended and is considered to be strategic infrastructure development (SID).

The pre-consultation meeting also allowed for the introduction of the proposed development and discussion of the same.

The meeting was attended by the Applicant, Greener Ideas Limited and TOBIN representatives. The meeting discussion was centred around the following key points:

- Client and EIAR / Planning Team;
- Site Context;
- Policy Context;
- Electrical Connection;
- Indicative Layout;
- Key Planning Application Considerations; and
- Next Steps.

A presentation was given providing information on the site and the proposed substation.

Following consultation with An Bord Pleanála under section 182E of the Planning and Development Act 2000, as amended it is has been confirmed that the board is of the opinion that the proposed development falls within the scope of section 182A of the Planning and Development Act, 2000 as amended and as such the proposed development is strategic infrastructure development (SID). The relevant consents process for the approval of the proposed development is to submit a planning application directly to An Bord Pleanála under Section 182A(1) of the Act. Copies of this determination is provided in Appendix 1-1 of the Chapter 2 in the EIAR.

2.4.2 Consultation with Statutory and Non-Statutory Bodies

EIAR scoping correspondence was submitted to relevant statutory and non-statutory bodies in December 2022 (by email) for review and comment. The list of consultees and a record of consultation is provided in Chapter 2 of the EIAR.

2.5 ASSUMPTIONS AND LIMITATIONS OF ASSESSMENT

Specific assumptions relevant to environmental aspects are set out in the corresponding EIAR Chapters. Some general assumptions that have been made during preparation of this EIAR are set out below:

- In undertaking cumulative assessments, consented, but as yet un-built, developments have been assumed to have been built in accordance with and within the duration permitted by the associated grant of permission; and
- Information provided by third parties, including publicly available information and databases, is correct at the time of publication.

Specific limitations relevant to certain environmental aspects are set out in the corresponding EIAR Chapter. Some general limitations associated with the preparation of this EIAR are set out below:

- Baseline conditions and assessments are assumed to be accurate at the time of the physical surveys but may be subject to change, due to the nature of the surrounding environment and surrounding activities; and
- The assessment of cumulative effects from built or consented developments is partially reliant on the availability of information provided by relevant third parties. Local Authority and An Bord Pleanála public planning registers were reviewed as part of the assessment process. None of the individual specialists have highlighted any limitations that are considered significant in terms of the undertaking of these specialist cumulative assessments.

2.6 PROJECT TEAM AND CONTRIBUTORS TO THE EIAR

TOBIN Consulting Engineers were engaged by Greener Ideas Limited to coordinate and prepare this EIAR. The relevant inputs of the various contributors and competent experts of the Project Team are provided in Table 2-3 and Table 2-4 of Chapter 2 in the EIAr.

It should be noted that the Project Manager and principal coordinator of this EIA Report was Louise Byrne, Senior Planner in TOBIN Consulting Engineers. Louise has over 8 years' experience in development management for local government, semi state and consultancy. Louise has a Masters in Regional and Urban Planning from University College Dublin and is a chartered member of the Royal Town Planning Institute.

3.0 DESCRIPTION OF THE PROPOSED DEVELOPMENT

3.1 THE PROPOSED DEVELOPMENT

The proposed Baldonnell 110kV substation site measures approximately 87.75m long, 22.25m wide and will be bounded by a 2.6m high palisade fence.

The compound will house a 126m² EirGrid 110kV substation control building which will measure 14m long x 9m wide x 6.7m high and will be finished externally with scud render & float in sand, white cement plaster, nap finish. The roof of the building will consist of standard Selected Blue/Black slate finish.

Associated outdoor electrical equipment will include:

- 1 no. 110kV transformer;
- 110kV Switchgear;
- an associated internal 20kV underground cable;
- an internal access track;
- a diesel generator;
- Lightning masts* measuring 18m in height;
- Approximately 15 Light Poles** measuring 3.5m in height.
- 2 no. security cameras and poles will be installed.

The site has been designed to meet EirGrid's specifications.

Access to the substation compound will be provided via the adjacent gas fired power plant site, with 2 no. 4.9m wide access gates proposed along the eastern boundary of the proposed substation site.

*Lightning Mast Design will be subject to a lightning survey and confirmed during the detailed design stage of the project.

** Lamp Poles will be the subject of a light survey and the exact number to be provided will be confirmed during the detailed design stage of the project.

It should be noted that within this planning application to An Bord Pleanála the location of the proposed IPP compound is overlapping with an IPP compound already approved under the adjacent Gas Fired Peaking Power Plant application Reg. Ref. SD21A/0167. However the infrastructure proposed as part of this planning application differs slightly. It is intended to build the IPP compound as set out under this planning application with any changes or amendments to application SD21A/0167 to be captured under a separate future consents process.

The proposed grid connection will consist of underground cabling (UGC). The underground cable route exits the proposed Baldonnell 110kV Substation from the northside fence and heads in a westerly direction. The route follows the private road (Falcon Avenue) west for approximately 250m until it reaches the entrance to Barnakyle 110kV Substation. The cable then turns south to enter the Barnakyle substation through existing ducts.

This section of the route is almost entirely within the road except for the crossover into the substation.

The UGC works will consist of the installation of 6 No. ducts in an excavated trench to accommodate 3 No. power cables, 2 No. fibre communications cable to allow communications between the Baldonnell and ESB Barnakyle 110kV Substation and one earth continuity conductor (ECC).

3.2 OPERATIONAL OVERVIEW

The proposed 110kV electrical substation (hereafter referred to as the "Baldonnell Substation") and associated grid connection are being developed to provide a connection from the adjacent peaking power plant to the existing electricity transmission system.

Electrical power will be exported from the power plant's main transformers through the proposed Baldonnell Substation to the existing Barnakyle 110kV substation, which is operated by EirGrid and owned by ESB. The associated grid connection works will consist of underground cabling.

The gas fired peaking power plant will operate when electricity demand is higher than average, typically during morning and evening peak usage times. The need for peaking plants on the Irish electricity grid has grown, as renewable forms of power generation increase their penetration onto the system. The variability of renewable generators increases EirGrid's challenge to operate an efficient, safe, and secure electricity system. The modular design of the Profile Park peaker plant, and its fast response capability, means it can react quickly to vary its output, mirroring the peaks and troughs of electricity generation, from renewable generators.

The development of the peaker plant with its associated substation and grid connection, are in line with policies set out in the National Development Plan and the Climate Action Plan 2021.The development is also consistent with Ireland's strategy to achieve its binding 2030 emission targets.

A temporary construction compound will be provided approximately 185m southeast of the proposed development site.

The compound will comprise of areas for temporary site offices (portacabins), staff welfare facilities, car parking, material and equipment storage and material laydown areas. Potable water, foul water and electrical connections will be provided to accommodate the above.

The site will be fully reinstated upon completion of all works.

3.3 CONSTRUCTION PHASE ACTIVITIES

3.3.1 Construction Phase Description and Duration

It is expected that construction will commence in 2023 with design, construction, and commissioning activities lasting for approximately 12 months. The proposed Baldonnell 100kV substation is expected to become fully operational, along with the gas fired power plant , which is currently expected to be operational in 2024, subject to timely receipt of the necessary statutory consents.

The total number of construction staff on-site will vary during the construction phase of the works but are expected to peak at approximately 20 persons per day. Standard working hours for construction will be 7.00am to 7.00pm Monday to Friday and 8.00am to 9.00pm on Saturday (if required), with no works on Sundays or Bank Holidays except in exceptional circumstances

or in the event of an emergency. All site personnel will be required to wear project notification labelling on high visibility vests and head protection so that they can be easily identified by all workers on-site.

Please refer to Appendix 3-1 of the EIA report, for a full description of the construction methodology for the proposed development.

3.3.2 Construction Environmental Management Plan

The primary objective of the Construction Environmental Management Plan (CEMP) is to safeguard the environment, site personnel, and nearby sensitive receptors, i.e., occupiers of residential and commercial properties, from site activity which may cause harm or nuisance. It is therefore intended to provide a framework to ensure transparent and effective monitoring, prevention, management, and compensation measures to address the environmental impacts associated with the proposed substation.

During construction, an EPC Contractor(s) will be appointed with responsibility for constructing the proposed substation. Performance of the EPC Contractor(s) will be monitored on a regular basis. The following activities will be undertaken throughout the duration of the construction period:

- Review contractor documents against the requirements of the CEMP;
- Undertake regular audits;
- Continuously check records;
- Set up a contractor reporting structure; and
- Conduct regular meetings where EHS is an agenda item.

It will be the responsibility of the EPC contractor(s) to implement the construction phase management and monitoring measures outlined in the CEMP. The EPC Contractor(s) will be required to undertake regular monitoring and inspections, keep up to date records as prescribed in the CEMP, and report regularly to Greener Ideas Limited.

During operation, Greener Ideas Limited will have responsibility for the operation of the adjacent gas fired power plant and part of the proposed Baldonnell 110kV substation, with the other half of the substation site owned and operated by ESB and EirGrid.

3.3.3 Construction and Demolition Waste Management Plan

A Construction and Demolition Waste Management Plan (CDWMP) has been prepared in accordance with the Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects , published by the EPA in November 2021. These guidelines replace the 2006 guidelines previously published by the former Department of the Environmental, Heritage and Local Government (DOEHLG) and the National Construction and Demolition Waste Council (NCDWC).

The main objective of these guidelines is to provide a practical and informed approach informed by best practice in the prevention and management of C&D wastes and resources from design to construction of a project (including consideration of deconstruction). The guidelines provide those involved in a project, including clients, developers, designers, practitioners, contractors, sub-contractors and competent authorities, with a common approach when preparing Resource and Waste Management Plans (RWMPs) for C&D projects.

The requirement to develop, maintain and operate this CDWMP to a detailed Construction & Demolition Waste Management Plan (CDWMP) will form part of the contract documents for the project.

On commencement of the project, the EPC Contractor appointed to undertake the works will be responsible for the development of this CDWMP and the implementation of all necessary protocols and measures to ensure regulatory compliance, including the provision of data to Greener Ideas Limited to enable fulfilment of reporting obligations.

3.4 OPERATION AND MAINTENANCE

3.4.1 Hours of Operation

The proposed Baldonnell 110kV substation will operate in parallel with the adjacent gas fired power plant. Its actual operating hours will be determined by EirGrid, who are the Transmission System Operator (TSO). They will issue dispatch instructions to the plant from the National Control Centre using an Electronic Dispatch Instruction Logger system (EDIL).

The environmental modelling undertaken as part of this EIA Report has predicted no significant environmental effects based on a worst-case operating scenario (i.e., operating 24 hours a day, 365 days per year unless otherwise stated)

3.4.2 Operational Staff

The proposed Baldonnell 110kV substation will be unmanned.

3.5 HEALTH AND SAFETY

A Project Supervisor Construction Stage (PSCS) will be appointed by Greener Ideas Limited for the construction phase of the substation. The PSCS will be responsible for managing and coordinating the safety and health issues on site.

It is important to note that the presence of a PSCS does not release other contractors/employers of their obligation to comply with their statutory safety and health obligations.

No substances will be stored on the proposed Baldonnell 110kV substation site and as such the project is not subject to any of the requirements contained in the Chemical Act (Control of Major Accident Hazards involving Dangerous Substances) Regulations 2015.

Batteries will be on site within the EirGrid compound building as part of normal operation. The transformer will be oil filled but there is no requirement for additional oil to be stored on site. The diesel generator will require diesel onsite for power outage situations only. It is not expected to have diesel stored on site. Otherwise, no chemicals will be stored on site.

A water storage tank will be provided on the power station site to ensure the security of the water supply for operational and firefighting needs. The tank shall serve both the ring main and hydrants. The latest calculations as provided to Irish Water, indicate that the water tank shall have a dedicated firefighting water storage capacity of circa 545m3, which will provide water at a rate of 75L/minute for 90 minutes.

3.6 DECOMMISSIONING

The proposed Baldonnell 110kV substation is expected to be operational in accordance with the adjacent gas fired power plant. The power plant is expected to be operational for at least 25 years. On cessation of activities, the plant will either be redeveloped as a power related facility or the site will be redeveloped in an alternative form.

In the event that the substation is decommissioned, the following programme will be implemented:

- All plant equipment and machinery will be emptied, dismantled, and stored under appropriate conditions until it can be sold. If a buyer cannot be found, the material will be recycled or disposed of through licensed waste contractors and hauliers. If plant and machinery is required to be cleaned on site prior to removal, all necessary measures will be implemented to prevent the release of contaminants;
- All waste will be removed from the facility; and
- The site and all associated buildings will be secured.
- Waste will be recycled wherever possible. All waste movement, recycling, and disposal operations will be controlled by licensed waste contractors.

Details of provisions to decommission and render safe or remove all materials, waste, ground, plant, or equipment contained on or in the site that may result in environmental pollution will be agreed with the Environmental Protection Agency as part of the Industrial Emissions Licensing process.

The proposed Baldonnell 110kV substation is expected to be operational in accordance with the adjacent gas fired power plant. The power plant is expected to be operational for at least 25 years. On cessation of activities, the plant will either be redeveloped as a power related facility or the site will be redeveloped in an alternative form.

In the event that the substation is decommissioned, the following programme will be implemented:
- All plant equipment and machinery will be emptied, dismantled, and stored under appropriate conditions until it can be sold. If a buyer cannot be found, the material will be recycled or disposed of through licensed waste contractors and hauliers. If plant and machinery is required to be cleaned on site prior to removal, all necessary measures will be implemented to prevent the release of contaminants.
- All waste will be removed from the facility; and
- The site and all associated buildings will be secured.
- Waste will be recycled wherever possible. All waste movement, recycling, and disposal operations will be controlled by licensed waste contractors.

Details of provisions to decommission and render safe or remove all materials, waste, ground, plant, or equipment contained on or in the site that may result in environmental pollution will be agreed with the Environmental Protection Agency as part of the Industrial Emissions Licensing process.

4.0 NEED FOR THE DEVELOPMENT

This chapter of the EIAR sets out the strategic policy context at a European and national level, for the proposed substation and its associated gas fired power plant, both of which are required to assist in reducing the use of fossil fuels in the generation of electricity in Ireland.

The key driver in the requirement for low-carbon generation technology is set out in binding European targets to reduce greenhouse gas emissions. The current and future demands of electricity generation are detailed and highlight the importance of gas power plants during Ireland's transition to a low-carbon future, as well as their potential to support expanding offshore wind generation in the Dublin region.

It is now widely recognised that Ireland has substantially and continually failed to meet past climate targets and that it must now significantly improve its performance in terms of decarbonisation in order to meet the 2030 targets that are becoming more important. As demonstrated by the strategic policies and binding targets on greenhouse gas emissions set out within European and national plans, investment in lower carbon technologies for electricity generation is a key prerequisite in achieving Ireland's 2030 renewable energy target and subsequent net zero carbon energy system by 2050. The transformation of the electricity system in Ireland will require the system to be more dynamic and responsive as the challenges of introducing non-synchronised generations sources, such as wind and solar, to a synchronised transmission system are overcome.

Electricity demand is increasing rapidly in the greater Dublin region, mainly due to the growth of data centres. As large consumers of electricity, data centres pose particular challenges to the future planning and operation of a sustainable power system. The growing energy demand within Dublin is recognised within the NPF as it states that improving energy sustainability within Dublin and its surrounding Environs will be a key future growth enabler with regard to population and employment.

The development of onshore and offshore renewable energy is dependent on the implementation of enabling infrastructure, such as the proposed substation and associated power plant at Profile Park.

The proposed substation and associated power plant in Profile Park is considered consistent with the overarching strategy to achieve the binding 2030 emission targets, as a lower-carbon generation source it will also be a vital technology to mitigate the deficiency in electricity generation following the planned closure of fossil fuel power plants across the island of Ireland in the next six years. The power plant also represents an important electricity generation source for Ireland's transition to a low carbon economy, which will require local agile distributed generation rather than relying on large, centralised power generation. Gas fired power plant technology allows the delivery of an efficient, safe and secure electricity system by helping to manage fluctuating electricity demands and compensate for shortages occurring from wind or solar power.

The proposed substation and its associated power plant at Profile Park will support the expansion of offshore wind generation in the Dublin region and the reinforcement of Ireland's energy distribution network will facilitate planned growth and energy provision across the country.

5.0 CONSIDERATION OF ALTERNATIVES

5.1 INTRODUCTION

To find the most suitable site for the proposed development, Greener Ideas Limited considered a number of factors, as recommended in the Draft EPA Guidelines (EPA, 2017).

Alternatives to the proposed development, in terms of layout and design, were considered under the following headings:

- Do Nothing' Scenario';
- Alternative Connection Points and Technologies
- Alternative Locations;
- Alternative Site Layouts and Cable Route Selection; and
- Alternative construction and Decommissioning Practices.

5.2 DO NOTHING SCENARIO

In the Do-Nothing scenario, Greener Ideas Limited would not develop a substation in Profile Park. In the absence of this substation, there would be:

- No method for electrical power generated at the adjacent powerplant site to be exported to the wider transmission network.
- Less integration of renewable technologies onto the Irish Grid which is one of the key strategic European and national objectives for the transition to a low carbon economy as set out in Chapter 4.0.
- Increased risk that older, less efficient and more polluting power plants would continue to operate and that proposals to decarbonise Ireland's power generation portfolio would be negatively impacted.
- The portfolio of dispatchable gas fired power plants available to manage fluctuating electricity demands and compensate for shortages occurring from wind or solar power would be reduced and this would result in increased grid instability.
- With respect to EirGrid's Data Centre Connection Policy, the absence of a substation for the associated power plant, raises the possibility that data centres will not develop on Profile Park, or they will seek to build their own power generating capability. However, the ability to centralise power generation within Profile Park, brings opportunities to better manage noise and emissions locally and potentially enabling lower built capacity, and less operating hours.
- The site on which the substation is proposed would more than likely remain unused, vacant and unchanged as a greenfield site.
- Given the size of the site, its unlikely to be developed by another developer despite the 'Enterprise and employment' zoning of the site under the South Dublin County Development Plan 2016-2022.

5.3 ALTERNATIVE CONNECTION POINTS AND TECHNOLOGIES

Greener Ideas Ltd submitted a grid connection application to EirGrid on 17th of November 2021, requesting a 100MW MEC grid connection to the adjacent proposed Kilcarbery Substation as illustrated in Figure 5-1 below. The Kilcarbery substation is proposed to be constructed as part of an adjacent Data Centre development and is currently under consideration by An Bord Pleanála (VA06S.312793).

On 21st of December 2021, EirGrid informed Greener Ideas Limited that for the purposes of the 2023-24T3 Capacity Market Auction, it should assume that the associated gas fired power plant's grid connection method will be 'a new 110 kV Air Insulated Switchgear ("AIS") Station tailed to the nearby Barnakyle 110 kV Station via 0.375 km of underground cable ("UGC")'. Refer to document OI29074-EGD-XX -XX-XX-DN-62-0001-S2 -PA1 attached in Appendix 5-1

On 14th of April 2022, EirGrid issued Greener Ideas Limited with a Connection Agreement, confirming the connection method and naming the new AIS substation 'Baldonnell'. It is Greener Ideas Limited understanding that due to commercial and planning matters associated with the adjacent proposed Kilcarbery Substation, and to ensure security of supply for the 2024/23 winter period, EirGrid have instructed this connection method to be utilised, as opposed to connection via the adjacent proposed Kilcarbery substation.

5.4 ALTERNATIVE LOCATIONS

No alternative sites have been considered for the proposed substation, as the location of the proposed development was determined with respect to overall siting and design of the associated gas fired power plant.

5.5 ALTERNATIVE SITE LAYOUT AND CABLE ROUTE SELECTION

Greener Ideas Limited considered an alternative site layout and cable route configuration which is presented below in Figure 5-1 and 5-2 of Chapter 5 of the EIAR. The proposed site layout was arrived at following extensive discussions between the Applicant and EirGrid/ESB. The alternative layout was ultimately discounted for the following reasons.

1. Preferred route reduced the number of 90-degree bends, so eliminating the need for the construction of Joint bays and allow the possible installation of the cable in a single pull.
2. Alternative cable route involved crossing 3rd party lands.
3. Alternative land would conflict with the possible future construction of the Kilcarbery GIS substation.
4. Alternative route would require the reconfiguration of the already approved GIL 15/110kV transformer, which received planning approval under application reg. SD21A/0167.

5.6 ALTERNATIVE CONSTRUCTION AND DECOMMISSIONING PRACTICES

Construction practices for the proposed Baldonnell substation are well understood and there are several thousand such plants in operation across the globe. Standard construction practices will be employed in the construction of this plant. Similarly, decommissioning practices will follow standard practices and will be carried out in accordance with EPA requirements as set out in the IE Licence. No alternative construction or decommissioning practices are considered in this EIAR as best practice or other regulatory requirements will be followed in all instances.

6.0 POLICY, PLANNING AND DEVELOPMENT CONTEXT

Relevant policy has been reviewed at an international (UN and EU), national, regional and local level. The proposed substation is consistent with the current energy and planning policy context, which seeks to increase the share of electricity generation from renewable sources and locate wind energy developments in suitable locations, thereby minimising any environmental impacts. The proposal will contribute to national and international efforts to reduce carbon emissions to the atmosphere and thereby help to address concerns regarding climate change.

The proposed Baldonnell Substation, its grid connection, and the associated power plant at Profile Park is considered consistent with the overarching planning framework set out in the above European, national, regional and local policies and plans. The rationale for this conclusion is based on the following:

European

- Ireland will miss the target set for the period 2013 to 2020 for renewables by about 3% and for cumulative emissions by a little under 5%. Furthermore, EPA's Greenhouse Gas Emissions 2018-2040 projections indicate that Ireland faces significant challenges in meeting EU 2030 reduction targets in the non-ETS sector and national 2050 reduction targets, particularly in electricity generation. Ongoing review and refinement of the national transmission, including the implementation of support / enabling infrastructure such as the proposed substation as part of the associated gas fired power plant, will allow Ireland to continue to invest in renewable sources of power to meet future national and EU targets.

National

- Due to the significant growth in demand for electricity, the national grid will require new solutions such as the proposed substation and associated gas fired power plant. The long-term renewal of the grid will need to be consistent with wider national, social, environmental, economic and energy policies, i.e., renewable energy targets and sustainability. Operation of the proposed substation will assist in regularising energy provision in the electricity grid. Specifically, the associated gas fired power plant would have the ability to respond quickly to the peaks and troughs of renewable generators, so providing electricity at times of high demand and low wind. This will assist in delivering a secure and sustainable electricity system.

Regional

- The RSES contextualises the Eastern and Midland Region as the '*economic engine of the State*' providing more than 1 million jobs, and as such, are a major load centre on the Irish electricity transmission system. Developing the electrical grid in the Region will enable the transmission system to safely accommodate more diverse power flows from renewable generation. Grid investment, and flexible power generation in the form of the power plant, will solve immediate infrastructural deficiencies in addition to accommodating expected long-term growth in population and economic development. Greater integration of renewable energy will ensure grid capacity to meet growing commercial demand such as high technology industries including data centres.

Local

- The policies and objectives contained within the CDP establish a clear precedence for the proposed substation due to the benefits and opportunities of dispatchable grid services, that will be facilitated.
- The proposed substation will be located within land zoned Enterprise and Employment.
- The precedence for the siting of gas fired power plants and associated infrastructure such as the proposed substation, is well established at this location in Profile Park, given the approval of similar development within the same zoning.

7.0 POPULATION AND HUMAN HEALTH

7.1 INTRODUCTION

This chapter examines the existing environment and addresses the potential impacts on population and human health arising from the proposed substation in Profile Park.

The two environmental factors of population and human health are addressed under separate headings. The assessment on population considers the current land use of the proposed substation site, the current activities occurring within and in the vicinity of the site, local population information, employment profiles and tourism.

The study area for population and human health includes review of relevant information on a county and national scale but is mainly concentrated on the Electoral Districts (ED) within which the project is located.

7.2 POPULATION

7.2.1 Land Use

The site of the proposed substation is located in Profile Park, Dublin 22 which is c.3 km west of Clondalkin town centre. Profile Park is a 100 acre (40.5 Ha) fully enclosed, private business park. Immediately adjacent to Profile Park is the Castlebaggot 110 / 220 kV substation which provides electrical transmission connectivity to the national electricity transmission grid system.

The site of the proposed substation is greenfield. The northern boundary of the site is bounded by the internal road network within Profile Park, while the east, south, and west boundaries of the site are bordered by greenfield. The existing Google PPK Data Centre Campus and Digital Realty Trust are located immediately to the south-west and south-east of the site respectively. There are no land use/activities on the existing site. The immediate area is predominantly commercial / industrial in nature.

Grange Castle Golf Course is located c.250 m east of the site and Baldonnel Aerodrome c.500 m south of the site. The nearest residential properties are located c.450 m to the south of the site and c.450 m to the northeast. The nearest primary school to the proposed site is Scoil Mochua (Primary School and Special Services) located c.1.3 km north-east and the nearest secondary school identified within the vicinity is Deansrath Community College c.1.7 km north-east of the proposed substation site. A number of community facilities and amenities are available in the wider geographical area, which are listed in more detail in Section 7.3.1.1 of Chapter 7 in the main EIAR.

Population Trends

An examination of the existing population in the study area has been carried out to identify population trends, density and to define the properties/receptors surrounding the proposed site.

During the period of 2006 to 2016, the population increased nationally by approximately 12% with the population of South Dublin County increasing by 12%. During this time, the population of Clondalkin Village ED increased by 5%, which represents an increase of 434 persons for the area. This illustrates that the population of the local area is increasing at a slower rate than rates

at county, regional and national level. In addition, the population density for the study area is generally sparse compared with the overall county.

Property/Receptors

The locations of properties and buildings (referred to as receptors) in the vicinity of the proposed substation have been identified using address data from the GeoDirectory database which is used to populate Eircodes. The validity of the GeoDirectory data has been confirmed by way of publicly available mapping, aerial imagery, and street-level imagery. All receptors within 1 km of the proposed site boundary have been identified and used to inform assessments within this EIAR.

Approximately 130 no. property receptors were identified within 1 km of the proposed substation location from the GeoDirectory database (January 2023). A review of this data using aerial photography indicates that most of these property receptors are present along the local road network to the north, south and west of the proposed substation location.

7.2.2 Potential Effects

7.2.2.1 Construction Phase

Land Use

As set out Section 3.4.1, Chapter 3, of the EIAR, it is expected that construction will commence in 2023 with design, construction, and commissioning activities lasting for approximately 12 months. The proposed Baldonnell 100kV substation is expected to become fully operational, along with the gas fired power plant , which is currently expected to be operational in 2024, subject to timely receipt of the necessary statutory consents.

The total number of construction staff on-site will vary during the construction phase of the works but are expected to peak at approximately 20 persons per day.

Population Trends

It is anticipated that there would be a positive direct effect on local population trends as a result of the construction of the proposed substation. Employment generation is considered to involve 20 persons during peak activities on site and this short-term increase in employment may also result in a short-term increased need for accommodation locally. This short-term positive effect will add value to the local economy. Otherwise, the construction of the proposed substation would not result in any permanent change to local population trends within the area or across SDCC. There will be a short-term and imperceptible effect on population.

Property/Receptors

Access to the proposed substation site will be provided via the adjacent gas fired power plant site. The adjacent gas fired power plant site is accessed via an entrance off the existing industrial estate roadway, with access to the Profile Park industrial estate provided north of the site via the R134 (New Nangor Road).

Negative effects on the local population as well as residential properties as a result of construction work, including construction related traffic movements, could impact on noise and

air quality. In addition, there is potential for works to impact local residential amenity, i.e., a resident's enjoyment of their home.

The delivery of construction equipment and materials is proposed via existing public roads, which are currently used by heavy goods vehicles (HGV)s. As a result, there will be a short-term increase in traffic related effects during the construction phase. These effects are assessed in detail in the Chapter 10 (Air Quality and Climate) and Chapter 11 (Noise and Vibration) of this EIAR.

It is considered that any negative effects arising during construction will be slight and short term in nature. In addition, it should be noted that properties located along the R134 (New Nangor Road), which will experience an increase in construction traffic movements are located at a distance from the proposed substation site, with the nearest residential dwellings in the area surrounding the proposed development located c.400 m or further from the site.

Property Value

The construction works for the proposed substation will not have any impact on the local property values. Profile Park and its surrounding business parks are zoned for 'Employment and Industry' and there is significant construction being undertaken in this area with no evidence of a reduction in house prices arising from this construction activity. The effect on property value will be neutral.

Employment/Economy

The proposed substation will lead to the support and creation of direct and indirect employment during construction. At a local level, employment will rise due to the staff required on site. At a regional and national level, employment will be created through specialised construction services as well as through the supply of building equipment and materials. As a result, the construction phase of the proposed substation will have a short-term, slight positive effect on employment and economy in the local area.

Tourism

There are a number of tourism attractions and public amenities within the study area including the Grange Castle Golf Course, Corkage Park, Clondalkin Round Tower and the Dublin Mountains Park. It is not considered that construction work will have any direct or negative impact on tourist amenities. In addition, there are no anticipated negative effects arising from construction for local recreational users. Effects are predicted to be neutral.

7.2.2.2 Operational Phase

Land use

The site of the proposed substation will change from a greenfield site zoned for 'Enterprise and Employment' development to a substation. This will result in a long-term and significant effect on land use which is consistent with the land use zoning of the site and its environs.

Population Trends

The substation will be unmanned, with routine maintenance and security services being carried out intermittently over its operational lifetime. It is not anticipated that the operation of the proposed substation will have any direct or negative impact on population trends. Effects are predicted to be neutral.

Property/Receptors

It is not anticipated that the proposed substation whilst in operation will have any significant or long term effect on sensitive local receptors (dwellings) within the area. The nearest residential dwellings are located over c.400 m or further from the proposed substation site.

Property Value

The proposed substation is not predicted to have any impact on the local property values. Profile Park and its surrounding business parks are zoned for 'Employment and Industry' and there is significant development of a similar nature, commercial and industrial infrastructure, in this area with no evidence of a reduction in house prices. The effect on property value will be neutral.

Employment/Economy

The substation will be unmanned, with routine maintenance and security services being carried out intermittently over its operational lifetime. There will be an neutral direct effect on employment, however, the indirect effects of the substation may include facilitating additional data centre development. In the event that this was to occur this would result in employment and other commercial opportunities which would have a slight to moderate indirect positive effect.

Tourism

As noted previously, there are several relevant tourism attractions and public amenities within the study area including the Dublin Mountains Park, as well as the adjacent Grange Castle Golf Course and Corkagh Park. It is not anticipated that the operation of the proposed substation will have any direct or negative impact on tourist amenities or local recreational amenities. Effects are predicted to be neutral.

7.2.2.3 Decommissioning Phase

The proposed Baldonnell 110kV substation is expected to be operational in accordance with the adjacent gas fired power plant. The power plant is expected to be operational for at least 25 years. On cessation of activities, the plant will either be redeveloped as a power related facility or the site will be redeveloped in an alternative form.

Details of provisions to decommission and render safe or remove all materials, waste, ground, plant, or equipment contained on or in the site that may result in environmental pollution will be agreed with the Environmental Protection Agency as part of the Industrial Emissions Licensing process.

7.3 POTENTIAL EFFECTS ON HUMAN HEALTH

7.3.1.1 Construction Phase

Air Quality and Dust Emissions

The greatest potential effect on air quality during the construction phase of the proposed substation is from construction dust emissions as a result of excavation works, infilling and landscaping activities and storage of soil in stockpiles. This leads to the potential for nuisance dust. While construction dust tends to be deposited within 350 m of a construction site, the majority of the deposition occurs within the first 50 m (IAQM, 2014)[22]. The extent of any dust

generation depends on the nature of the dust (soils, sands, gravels, silts etc.) and the nature of the construction activity. In addition, the potential for dust dispersion and deposition depends on local meteorological factors such as rainfall, wind speed and wind direction.

The construction of the proposed substation will take place away from residential properties (receptors) with the nearest receptor located over c.400 m from the site. As set out in Chapter 10 (Air Quality and Climate), dust and particulate matter effects from the site will be imperceptible, direct, neutral, and short-term in nature, and therefore is predicted to pose no nuisance to nearby sensitive receptors.

Noise and Vibration

During the construction phase of the proposed substation there will be some effect on nearby noise sensitive properties due to noise emissions from typical construction activities. However, given the scale of the proposed development, the distances between the main construction works and nearby noise sensitive properties, and that the construction phase of the proposed substation is temporary in nature, it is expected that the various noise sources will not be excessively intrusive.

Due to the distance of the proposed works from sensitive locations significant vibration effects are not expected, and construction vehicle movements are not expected as a significant source of vibration along the existing road networks.

Furthermore, appropriate noise and vibration control measures will be implemented, and will ensure that noise and vibration effect is kept to a minimum. Noise effects are predicted to be slight and short term. Vibration effects are predicted to be not significant and momentary.

Health and Safety

All activities carried out by the appointed Contractor on the proposed substation will be in accordance with the requirements of the Safety, Health and Welfare at Work Act 2005 as amended and Regulations made under this Act.

7.3.1.2 Operational Phase

Air Quality

As set out in Chapter 10 (Air Quality and Climate), emissions from the site will not result in a significant effect on human health. It can be concluded that dust and particulate matter effects from the site will be long-term, direct, neutral and imperceptible in nature, and therefore is predicted to pose no nuisance to nearby sensitive receptors.

Noise and Vibration

With respect to the operational phase of the proposal, the predicted noise and vibration levels are expected to be within best practice noise limits. As set out in Chapter 11 (Noise and Vibration), review of the predicted increases in noise level at the nearest residential noise sensitive locations conclude that the associated effect is 'not significant' at all locations for daytime, evening and night time periods. Therefore, in relation to noise, the associated effect is predicted to be not significant and long-term.

Health Benefits

Aside from the potential socio-economic benefits previously discussed, there are environmental benefits to the proposed substation. The contribution of the proposed substation, in supporting the Profile Park Power Plant to achieve a decrease in reliance on fossil fuel combustion will have a moderate to significant positive long-term effect on the health and well-being of the general population.

Residential Amenity

Residential amenity relates to the human experience of a person's home, derived from the general environment and atmosphere associated with the residence. The quality of residential amenity is influenced by a combination of factors, including site setting and local character, land-use activities in the area and the relative degree of peace and tranquillity experienced at the residence. The nearest dwellings to the proposed substation are located approximately 400 m or further from the site. Access to the proposed substation site will be provided via the adjacent gas fired power plant site via the R134 (New Nangor Road) and therefore these properties will be unaffected by the proposed substation. There will therefore be a neutral effect on amenity.

7.4 MITIGATION AND MONITORING MEASURES

No specific mitigation or monitoring measures are proposed for the construction or operational phase in terms of population and human health outside of those specified in the respective technical chapters of the EIAR as referenced in Section 7.1 of the Chapter.

7.5 RESIDUAL EFFECTS

The proposed substation will have a slight positive residual impact on the local economy through construction worker spending.

The proposed substation will provide a connection to the existing electricity transmission network for the adjacent peaking power plant, supporting the power plant in the balancing of the grid to enable greater renewable development on a national scale and help to achieve targets in national energy and climate change policies as well as provide the possibility for the future connection of data centre development to a direct energy supply. This is a direct positive long-term residual effect at a national level.

With an operational life expectancy of 25-years, the plant will either be redeveloped / upgraded and continue in its current use as a substation, or the site will be redeveloped in an alternative form.

8.0 LAND, SOILS AND GEOLOGY

8.1 INTRODUCTION

This chapter of the EIAR assesses the effects of the proposed substation, as described in Chapter 3 'Description of the Development', on the land, soil and geological environment. Information on the existing soil and geological environment is presented as a baseline for the site. The potential effects of the proposed development are discussed along with recommended mitigation measures for each potential effect. Any residual and cumulative effects are also assessed.

The regional review of geological conditions covers a zone of 2 km from the site boundary, as suggested in the Institute of Geologists of Ireland (IGI) guidelines. The proposed development site is located within industrial landscape which has recently been developed. An existing datacentre is adjacent to the proposed development's boundary. The Grange Castle Golf Club is located approximately 0.2km to the east and northeast of the proposed development. The entire proposed project is described in detail in Chapter 3 of this EIAR.

The regional soils in this area, including the grid and gas connection, indicate that the site consists of 2 no. types of soil, namely basic deep poorly drained mineral and basic deep well drained mineral. The development area within the red line boundary is underlain mostly by basic deep poorly drained material. The dominant subsoil occurring in the region is classified as till. The site is underlain by till derived from limestone (TLS) . The bedrock geology on the GSI 1:100 000 map indicate that this site is underlain by Lucan Formation limestone.

The GSI database contain records of verified borehole logs, groundwater wells and springs within and close to the site of the granted power plant. Bedrock exposures in the local area indicate strong to moderately strong, dark grey, fine grained, argillaceous limestones with minor calcareous shales.

8.2 POTENTIAL EFFECTS

The construction of the development will require removal of topsoil and subsoil to a competent founding layer and upfilling with structural fill and/or concrete to the required finished floor level. Overall, the excavations for the substation will have a neutral environmental effect. The grid connection will be laid beneath the ground surface and/or private road. The excavation required for the grid connection will have an imperceptible, temporary and neutral environmental effect on soils and geology. The pre-mitigation construction potential impact is imperceptible, negative, and long-term due to the relatively small footprint of infrastructure and its location.

During the operational phase of the project, no new impacts on the soil and geological environment will arise. A few direct impacts are possible during the operational phase of the proposed development which may include some construction traffic may be necessary for maintenance of the site which could result in minor accidental leaks or spills of fuels/ oils affecting the groundwater and potential spills and leaks of oils from infrastructure and equipment resulting in contamination of soils and water. Mitigation measures will the negate the potential negative effects and therefore no cumulative impacts on the soils and geology environment are envisaged during the operational stage, as there will be no significant movement of soils/subsoils, or construction works, during this period. The effects of operation on natural resources such as land, soils and geology will be imperceptible and long-term.

8.3 MITIGATION AND MONITORING MEASURES

The mitigation measures have been based on CIRIA (Construction Industry Research and Information Association, UK) technical guidance on water pollution control and on current accepted best practice (CIRIA, 2001). Good site practice will be applied to ensure no fuels, oils, wastes or any other substances are stored in a manner on site in which they may spill and enter the ground. Dedicated, bunded storage areas will be used for all fuels or hazardous substances. All works will be managed and carried out in accordance with the Construction and Environmental Management Plan (CEMP).

All excavation works during the construction stage will be monitored by an experienced geotechnical engineer or engineering geologist . The management of geological materials and spoil is an important component of controlling dust and sediment and erosion control. Excavated soils and bedrock will only be moved short distances from the point of extraction and will be used locally for landscaping. Landscaping areas will be sealed and levelled using the back of an excavator bucket to prevent erosion. The upper vegetative layer will be stored with the vegetation part of the sod facing the right way up to encourage growth of plants and vegetation at the surface of the landscaped soils. These measures will prevent the erosion of soil in the short and long term. Soils, overburden, and rock will be reused on site to reinstate any excavations where appropriate. To ensure slope stability, excavations will be battered back (sloped) to between 1:1 and 1:2 depending on depth and type of material. The earthworks will not be scheduled to be carried out during severe weather conditions. Following these mitigation measures, the resultant effect will be not significant, permanent and negative.

The operational team will carry out maintenance works and will put in place mitigation measures to reduce the risk of hydrocarbon or oil spills during the operational phase of the substation. Mitigation measures applied during decommissioning activities will be similar to those applied during construction where relevant.

8.4 RESIDUAL EFFECTS

The replacement of topsoil, subsoils and rock, with gravels, concrete and impermeable surfaces for the construction of the infrastructure (temporary and permanent) will result in a change in ground conditions within the proposed development site. Overall, this residual effect is permanent but not significant.

All potential effects on the soil and geological environment will be mitigated through good site practice on vehicular movements, management of fuels, sustainable use of soils etc. Overall, the residual effects from these aspects will be not significant to imperceptible, temporary and negative.

9.0 HYDROLOGY AND HYDROGEOLOGY

9.1 INTRODUCTION

This chapter describes the existing hydrological, hydrogeological and water quality characteristics at the site of the proposed project. The potential effects on the water environment arising from the development of the substation and associated infrastructure, including the grid connection, are assessed. The drainage of the project is considered which includes proposed mitigation measures to reduce any potential negative effects associated with the construction, operation and decommissioning of the proposed development. Any residual effects are also assessed.

In this chapter, the potential impacts on the water environment resulting from the proposed development are evaluated and mitigation measures are proposed to reduce any significant impacts. Based on the mitigation measures proposed, the significance of the residual impact on the water environment is determined.

The significance of effects of the proposed development has been assessed in accordance with the EPA guidance document Guidelines on the Information to be contained in Environmental Impact Assessment Reports (2022)[1]. Table 2-2 (available in Chapter 2) is taken from the EPA document. It outlines guidance for describing the quality and significance of effects.

The site of the proposed substation is located within the National River Basin District of the 2nd cycle river basin management plan, formerly the Eastern River Basin District (ERBD) within the 1st cycle river basin management plan. At a local scale, the Baldonnell Stream flows through the site from in a north-south direction. The Baldonnell stream continues to flow northwards, discharging into the Griffeen River which then discharges into the River Liffey at Lucan. The proposed development is not located within a catchment which has identified ecological habitats such as NHA's, SACs and SPAs. Minor surface water ponding occurs on the site. The surface water ponding is considered to be seasonal and mainly associated with periods of heavy, prolonged and intense rainfall.

With regards to existing ground water quality, the Water Framework Directive for the period 2013-2018 describes the groundwater quality status of the study area as 'Good' for Dublin GWB.

9.2 POTENTIAL EFFECTS

During construction activities, Exposed and disturbed ground may increase the risk of erosion and subsequent sediment laden surface water runoff. The release of suspended solids is primarily a consequence of the physical disturbance of the ground during the construction phase, if not correctly compacted. Hardstand areas and additional sealed surfaces could potentially reduce the infiltration capacity of the soils in areas where earthworks are undertaken and increase the rate and volume of direct surface runoff. Surface water control measures are incorporated into the design of the proposed development. The potential for an increase in runoff to streams is limited as surface water runoff will be controlled as part of the project design.

In terms of flooding, It is estimated that the natural landscaping and topography of the site will provide safe exceedance flow paths and prevent surface water ponding, therefore minimising

residual risks associated with an extreme flood event or a scenario where the stormwater drainage system becomes blocked.

The pathways identified for construction earthworks are drainage and surface water discharge routes. The main receptors are downgradient rivers (Liffey) and associated dependent ecosystems.

Due to the operational nature of the proposed site, the handling, containment, use and disposal of chemicals on site will be required at any given time leading to occasional accidental emissions of potentially polluting substances. This could cause localised contamination of site drainage/ surface water features, i.e., Baldonnell Stream.

Surface water arising at the site will be managed by a dedicated stormwater drainage system designed in accordance with SuDS, limiting discharge from the site to greenfield runoff rates. On this basis, it is predicted that the development of the site will not increase the risk of flooding elsewhere in the catchment.

9.3 MITIGATION AND MONITORING MEASURES

In order to mitigate potential effects during the construction phase, best practice construction methods will be implemented in order to prevent water (surface and groundwater) pollution. A Construction and Environmental Management Plan (CEMP) was developed for the project to ensure adequate protection of the water environment. All personnel working on the project will be responsible for the environmental control of their work and will perform their duties in accordance with the requirements and procedures of the CEMP.

It is recommended that local surface water features in the immediate vicinity of the site boundary are monitored pre-construction and during construction to take account of any variations in the quality of the local surface water and groundwater environment as a result of activities related to the proposed development. During the construction phase, field testing and laboratory analysis of a range of parameters will be undertaken at adjacent watercourses, specifically following heavy rainfall events (i.e., weekly, monthly and event based as appropriate).

The potential impact of hydrocarbon or oil spills during the operational phase of the development are limited by the size of the fuel tank of vehicles used on the site. Mitigation measures for the potential release of hydrocarbons or oil spills include:

- The plant and vehicles to attend site should be regularly inspected or at least prior to the scheduled site visit to be free from leaks and is fit for purpose;
- Fuels stored on site will be minimised, any storage areas will be bunded appropriately for the fuel storage volume for the time period of the operation;
- Operational team to be competent and trained in an emergency plan for the operation phase to deal with accidental spillages; and
- Spill kits will be available to deal with accidental spillages.

Regarding wastewater effluent, wastewater will be pumped to an existing holding tank which will be maintained, monitored and emptied to a licensed facility.

Operators will receive specific training on the handling, containment, use, and disposal requirements for all potentially polluting products on site. All chemicals stored on site will be subject to a Control of Substances Hazardous to Health assessment and compliance.

9.4 RESIDUAL EFFECTS

The potential residual effects on the surrounding water quality, hydrology and existing drainage regime at the site are considered to be slight and temporary/short term in nature.

The construction timescale of activities within the site will be short-term in duration and, thereafter, the only activities occurring within the site will be associated with maintenance, such as maintaining the hardstanding and existing drains, ongoing maintenance, replacement of infrastructure and onsite infrastructure and monitoring during the operational phase. There are no significant long-term effects.

The design of the proposed development has taken account of the potential effects of the development and the risks to the surface water and groundwater environment. Measures have been developed to mitigate the potential effects on the water environment. These measures seek to avoid or minimise potential effects in the main through the implementation of best practice construction methods and adherence to all relevant legislation.

10.0 AIR QUALITY AND CLIMATE

10.1 INTRODUCTION

This chapter evaluates the impacts which the proposed development may have on Air Quality & Climate as defined in the Environmental Protection Agency (EPA) document Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA, 2022b) and Draft Advice Notes for Preparing Environmental Impact Statements (EPA, 2015).

10.2 POTENTIAL EFFECTS

Air Quality

The construction phase has the potential to impact air quality through construction dust emissions, however, It was determined that as the construction stage traffic does not meet any of the above criteria a detailed air quality assessment is not required as there is no potential for significant impacts to air quality from traffic emissions.

With respect to the operational phase, he TII PE-ENV-01106 (2022) scoping criteria was used to determine the road links required for inclusion in the modelling assessment. As none of the road links impacted by the proposed development met the scoping criteria a detailed assessment was scoped out as there is no potential for significant impacts to air quality from traffic emissions

There is at most a low risk of dust impacts as a result of the proposed construction phase. Nevertheless, in order to ensure that no dust nuisance occurs during the earthworks, construction and trackout activities, best practice dust mitigation measures will be implemented.

There is also the potential for traffic emissions to impact air quality in the short-term over the construction phase. Particularly due to the increase in HGVs accessing the site. The construction stage traffic has been reviewed and a detailed air quality assessment has been scoped out as none of the road links impacted by the proposed development satisfy the TII REM assessment criteria. It can therefore be determined that the construction stage traffic will have an imperceptible, direct, neutral and short-term impact on air quality.

Following the IAQM guidance (2014), the proposed earthworks can be classified as 'large'. As a worst case. When combining this with the previously established sensitivity of the area (Section 10.3.3) this results in an overall low risk of dust soiling impacts and a low risk of human health impacts as a result of earthworks activities

The proposed development will not increase traffic levels by more than the scoping criteria), therefore, an assessment of the impact of traffic emissions during the operational phase on ambient air quality is not necessary as no significant impacts are likely. It can be concluded that the impact of the proposed development in terms of air quality is long-term, localised, direct, neutral and imperceptible.

Climate

There is the potential for a number of greenhouse gas emissions to atmosphere during the construction of the development. Construction vehicles, generators etc., may give rise to CO_2 and N_2O emissions. The Institute of Air Quality Management document *Guidance on the Assessment of Dust from Demolition and Construction* (IAQM, 2014) states that the proposed

development is unlikely to make a significant impact on climate. Therefore, in accordance with the EPA Guidelines, the impact will be short-term, neutral and imperceptible.

There are no potential impacts associated with the proposed development during the operational stage as the transmission line will be buried underground. It can be determined that the impact to climate during the operational stage is long-term, neutral and imperceptible.

10.3 MITIGATION AND MONITORING MEASURES

The pro-active control of fugitive dust will ensure the prevention of significant emissions, rather than an inefficient attempt to control them once they have been released. The main contractor will be responsible for the coordination, implementation and ongoing monitoring of the dust mitigation measures.

In summary the measures which will be implemented will include:

- Hard surface roads will be swept to remove mud and aggregate materials from their surface while any un-surfaced roads will be restricted to essential site traffic.
- Any road that has the potential to give rise to fugitive dust must be regularly watered, as appropriate, during dry and/or windy conditions.
- Vehicles exiting the site shall make use of a wheel wash facility where appropriate, prior to entering onto public roads.
- Vehicles using site roads will have their speed restricted, and this speed restriction must be enforced rigidly. On any un-surfaced site road, this will be 20 kph.
- Public roads outside the site will be regularly inspected for cleanliness and cleaned as necessary.
- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods.
- During movement of materials both on and off-site, trucks will be stringently covered with tarpaulin at all times. Before entrance onto public roads, trucks will be adequately inspected to ensure no potential for dust emissions.

At all times, these procedures will be strictly monitored and assessed. In the event of dust nuisance occurring outside the site boundary, movements of materials likely to raise dust will be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations.

10.4 RESIDUAL EFFECTS

The mitigation measures that will be put in place during construction of the proposed development will ensure that the impact complies with all EU ambient air quality legislative limit values which are based on the protection of human health. Therefore, the predicted residual impact of construction of the proposed development is direct, negative, short-term and imperceptible with respect to human health. There are no operational emissions from the proposed development, therefore the impact on air quality, human health and climate is predicted to be long-term, neutral and imperceptible.

11.0 NOISE AND VIBRATION

11.1 INTRODUCTION

This chapter of the Environmental Impact Assessment Report (EIAR) describes the assessment undertaken of the potential noise and vibration impact from the proposed Profile Park substation and grid connection project on local residential amenity and commercial properties. Electrical power will be exported from the power plant's main transformers through the proposed Baldonnell 110kV substation to the existing Barnakyle 110kV substation, which is operated by EirGrid and owned by ESB. The associated grid connection works will consist of underground cabling. A full description of the proposed project is provided in Chapter 3 – Description of the Proposed Development.

Some 16 no. noise assessment locations have been identified that are representative of the nearest residential, commercial and amenity locations. The nearest occupied residential noise sensitive locations (NSL) are located some 400 m to the south of the site (i.e. R001) and some 450 m to the north east (i.e. R014). The closest amenity to the development is GrangecasIte Golf Course (i.e. R015) which is located to the east of the development lands.

Noise and vibration impact assessments for the nearest NSLs have been prepared for the construction and operational phase of the proposed development. To inform this assessment baseline noise levels have been measured in the vicinity of a number of NSLs surrounding the proposed development. Noise predictions to the nearest NSLs have been prepared for both the construction and operational phases.

11.2 POTENTIAL EFFECTS

When considering a development of this nature, the potential noise and vibration effects on the surroundings must be considered for two stages: the short-term construction and the long-term operational phase.

The assessment of construction noise and vibration and has been conducted in accordance best practice guidance contained in *BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise and BS 5228-2:2009+A1:2014 Code of* practice for noise and vibration control on construction and open sites – Vibration. Subject to good working practice as recommended in the EIAR, noise associated with the construction phase is not expected to exceed the recommended limit values. The associated noise and vibration are not expected to cause any significant effects.

Based on detailed information on the site layout, plant noise emission levels, noise levels have been predicted at NSLs. The predicted operational noise levels will be within best practice noise limits; therefore, it is not considered that a significant effect is associated with the development.

No significant vibration effects are associated with the operation of the site.

11.3 MITIGATION AND MONITORING MEASURES

Regarding construction/decommissioning activities, reference shall be made to BS 5228-1:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites – Noise*, which offers detailed guidance on the control of noise and vibration from construction activities. It is proposed that various practices be adopted during construction as required, including the following:

- limiting the hours during which site activities likely to create high levels of noise or vibration are permitted;
- establishing channels of communication between the contractor/developer, Local Authority and residents;
- appointing a site representative responsible for matters relating to noise and vibration;
- monitoring typical levels of noise and vibration during critical periods and at sensitive locations; and
- keeping the surface of the site access roads even to mitigate the potential for vibration from lorries.

Furthermore, a variety of practicable noise control measures will be employed. These include:

- selection of plant with low inherent potential for generation of noise and/ or vibration;
- placing of noisy / vibratory plant as far away from sensitive properties as permitted by site constraints, and;
- regular maintenance and servicing of plant items.

Noise and vibration monitoring is proposed in accordance with the guidance contained in *British Standard BS5528* during the construction phase.

11.4 RESIDUAL EFFECTS

During the construction phase of the project there will be some effect on nearby noise sensitive properties due to noise emissions from site traffic and other construction activities. However, given the distances between the main construction works and nearby noise sensitive properties and the fact that the construction phase of the development is temporary in nature, it is expected that the various noise sources will not be excessively intrusive. Furthermore, the application of binding noise limits and hours of operation, along with implementation of appropriate noise and vibration control measures, will ensure that noise and vibration effect is kept to a minimum.

12.0 BIODIVERSITY

12.1 INTRODUCTION

This chapter presents a Biodiversity Impact Assessment of the proposed development and should be read in conjunction with Chapter 3 (Description of the Proposed Development). Details of the assessment methodology and existing site conditions are presented, potential impacts are assessed, and mitigation measures are recommended, where required.

The European sites; North Dublin Bay SAC (000206), South Dublin Bay SAC (000210) , South Dublin Bay and River Tolka Estuary SPA (004024) and North Bull Island SPA (004006) are all hydrologically connected to the proposed development site via the Baldonnell Stream and the River Liffey (hydrological route ca. 30km).

There are no NHAs located within 15km, or with a hydrological link, to the proposed development site.

Four pNHAs; Liffey Valley pNHA (000128), North Dublin Bay pNHA (000206), South Dublin Bay pNHA (000210) and Dolphin Docks pNHA (000201) are all hydrologically connected to the proposed development site via the Baldonnell Stream and the River Liffey (hydrological route ca. 30km).

12.2 POTENTIAL EFFECTS

TOBIN prepared an AA Screening Report (which accompanies this EIAR in the Planning Application package) which assessed the potential for the proposed development to have likely significant effects on European sites(s) either alone or in-combination with other plans and projects. The screening assessment concluded that the proposed development, either alone or incombination with other plans and projects, will not result in likely significant effects on any European site, in view the conservation objectives of the site, and therefore a stage 2 Appropriate Assessment was not required.

Due to the similar location of the national sites to the above mentioned European sites, there is similarly no potential for water quality impacts on the sites due to the lack of instream works, the separation distance (ca. 120m) between the proposed development site and the Baldonnel Stream, the downstream hydrological distance (ca. 30km), coupled with the small scale and temporary nature of the proposed construction works associated with the proposed development. No impacts on the four pNHA sites are anticipated.

The development of the proposed substation will result in a permanent loss of approximately 0.2ha of the mosaic habitat comprised of wet grassland and bare ground. The temporary construction compound will result in a temporary loss of approximately 1.2ha of dry meadow habitat. Following the completion of the construction phase, the construction compound infrastructure will be dismantled and removed offsite. No areas of treeline or hedgerow will be removed to facilitate the proposed development. No other areas of habitat will be lost to facilitate the proposed development

The construction works have the potential to result in the runoff of sediment and/or construction pollution and the generation of dust during the works.

No listed non-native invasive plant species were recorded within the proposed development site during the field surveys. There is potential, however, for the construction works to result in the introduction of invasive non-native species if not appropriately managed.

No evidence of otter, including otter holts or layups/couches, were recorded along the Baldonnell Stream within the ZoI of the proposed development. No instream works will occur within the Baldonnell Stream. The proposed works will not result in any loss of important habitat for otter. A degradation of otter feeding resources located downstream would constitute a short-term, slight negative effect on otter at a local geographical scale.

There is potential that the proposed development site may support other small, protected mammal species such as hedgehog, pygmy shrew or Irish hare. However, considering the availability of higher valuable habitat within the surrounding environment and the lack of evidence of such species within the site, it is considered that the proposed development site is unlikely to support significant numbers of protected small mammals. The proposed construction works have the potential to result in the loss of habitat and disturbance of such species. However, given the low number of species likely to be using the site and the mobile nature of these species, the clearance of vegetation and disturbance is likely to result in short-term, slight, negative effects on the local population of small mammal species, at a local geographical scale.

The proposed construction works will result in the permanent loss of approximately 0.2ha of habitat which currently comprises a mosaic of wet grassland and bare ground. The areas of undisturbed wet grassland may provide some suitable habitat for ground nesting bird species. However, considering the small area of habitat which will be lost and the availability of alternative habitat within the surrounding area, the loss of 0.2ha habitat is unlikely to significantly impact local bird populations. The loss of habitat is likely to have a permanent, imperceptible, negative effect on the local bird population at a local geographical scale.

Construction related noise and the physical presence of machinery and construction personnel can result in the disturbance of birds from habitats located in close proximity to the proposed development site. The proposed construction works may result in short-term disturbance to breeding and wintering bird species which forage within the surrounding area; however, considering the small scale and short-term nature of the proposed development, it is likely that birds will acclimatise to human presence over time. The disturbance of bird species is likely to have a short term, imperceptible effect on the local bird population at a local geographical scale. The proposed construction works have the potential to result in a degradation of water quality and aquatic vegetation, in the absence of mitigation measures.

The proposed substation will be operated remotely with occasional site and maintenance visits. As such there will be a minimal increase in vehicular movements to the site and no associated increase in noise, dust or emissions.

During the operational phase, there are no predicted direct noise or vibration impacts from the redeveloped substation, as outlined in Chapter 11 Noise and Vibration. The only operational phase noise from the proposed substation redevelopment will be vehicle noise associated with maintenance visits to the site which will be irregular. Permanent lighting is proposed within the proposed development with an activation switch. Lighting will only be switched on when maintenance staff are present on site. Disturbance during the operational phase of the proposed development has the potential to result in long-term, imperceptible, negative effects on the local fauna at a local geographical scale.

Although the proposed substation will be unmanned, any wastewater generated at the proposed development site will arise from a welfare facility, consisting of a sink and toilet for operatives use when on site. It is proposed to discharge wastewater generated on the site into the permitted new infrastructure on the neighbouring Power Plant site, reducing the number of connections required into the existing network within the Profile Park Campus Falcon Avenue access road. The wastewater layout has been designed in accordance with Irish Water's latest

standard details and code of practice. Thus, there is no potential for water quality impacts from foul water on the receiving environment

12.3 MITIGATION AND MONITORING MEASURES

A Construction Environmental Management Plan (CEMP) has been prepared and provides a framework for how significant effects on the environment will be avoided during the construction phase.

A suitably qualified Ecological Clerk of works (ECoW) will be appointed by the Contractor. The ECoW will oversee all construction works and monitor any possible sources for impacts for the duration of the construction programme. The ECoW will guarantee the construction phase of the proposed development will be undertaken in strict agreement with the methods prescribed within the CEMP and will have the power to stop the works in case any activities/works are not compliant.

A pre-construction botanical survey should be carried out. In the event that a Flora Protection Order (FPO) or Red Listed plant species is identified within the footprint of the works area, appropriate mitigation such as translocation will be implemented.

Construction vehicles will be restricted to designated areas access tracks to avoid impacting adjacent habitats and to ensure that soil compaction is restricted to these tracks. All disturbed ground will be fully reinstated following the completion of the works.

In order to comply with Regulations 49 and 50 of the European Communities (Birds and Natural Habitat) Regulations (2011), the appointed Contractor will ensure biosecurity measures are implemented throughout the construction phase to ensure the introduction and translocation of invasive species is prevented.

Measures to prevent accidental spillage/leakage of chemicals and pollutants and uncontrolled runoff of contaminated surface water and sediment are outlined in Chapter 8 (Land, Soils and Geology) and Chapter 9 (Hydrology and Hydrogeology).

The area which provides suitable bird nesting habitat (i.e. wet grassland) will not be removed, cleared or trimmed between the 1st March and 31st August, to avoid impacts on nesting birds

12.4 PROTECTED UNDER THE WILDLIFE ACTS AND/OR BIRDS DIRECTIVE. RESIDUAL EFFECTS

The design of the proposed development has considered the existing ecological conditions within the receiving environment. It is anticipated that with the implementation of mitigation measures (as outlined above), the construction, operational and decommissioning phases of the proposed development, will not result in significant residual effects on biodiversity.

12.5 RESIDUAL EFFECTS

During the construction phase, the development will have a slight positive residual impact on the local economy through construction worker spending.

The proposed substation will provide a connection to the existing electricity transmission network for the adjacent peaking power plant, supporting the power plant in the balancing of the grid to enable greater renewable development on a national scale and help to achieve

targets in national energy and climate change policies as well as provide the possibility for the future connection of data centre development to a direct energy supply. This is a direct positive long-term residual effect at a national level.

In the event where the substation is decommissioned, details of provisions to decommission and render safe or remove all materials, waste, ground, plant, or equipment contained on or in the site that may result in environmental pollution will be agreed and undertaken as required by the relevant planning conditions.

13.0 CULTURAL HERITAGE

13.1 INTRODUCTION

IAC Archaeology has prepared this chapter to assess the impact, if any, on the archaeological and cultural heritage resource of a proposed development at Profile Park. The assessment determines, as far as reasonably possible from existing records, the nature of the archaeological and cultural heritage resource in and within the vicinity of the proposed development area using appropriate methods of study. An impact assessment was undertaken to identify potential adverse impacts that the proposed development may have on the cultural heritage resource, while the mitigation strategy is designed to avoid, reduce, or offset such adverse impacts.

13.2 POTENTIAL EFFECTS

There is no potential impact on the archaeological and cultural heritage resource within the extent of the proposed development which is located within an existing area that has been stripped of topsoil (archaeologically monitored) and the existing roadway. Whilst the remainder of the proposed development area (compound area) has been subject to disturbance, it is unclear how this disturbance may have affected the potential archaeological resource. It remains possible that ground disturbances associated with the development may have a direct negative impact on archaeological remains that may survive within the site. Impacts have the potential to range from moderate to significant in scale, prior to the application of mitigation.

No potential negative impacts upon the cultural heritage resource are predicted because of the construction of the proposed development.

No negative impacts during operation are predicted upon the archaeological and cultural heritage resource.

13.3 MITIGATION AND MONITORING EFFECTS

All topsoil/overburden removal within the compound area will be monitored by a suitably qualified archaeologist. If any features of archaeological potential are discovered during the works further archaeological mitigation may be required, such as preservation in-situ or by record. Any further mitigation will require approval from the National Monuments Service of the Department of Housing, Local Government and Heritage (DoHLGH).

The mitigation measure identified above would also function as a monitoring system during construction to allow the further assessment of the scale of the predicted effects and the effectiveness of the recommended mitigation measures.

As there are no potential effects on the cultural heritage resource, no mitigation is deemed necessary.

No mitigation relating to the operational phase and the archaeological and cultural heritage resource is required.

13.4 RESIDUAL EFFECTS

There are no predicted residual effects for the operational phase of the proposed development upon the archaeological and cultural heritage resource.

14.0 LANDSCAPE AND VISUAL IMPACT ASSESSMENT

14.1 INTRODUCTION

The Townscape and Visual impact Assessment report was prepared in respect of a 110kV electrical substation at a site located in Profile Park, Dublin 22. The report describes the townscape/visual context of the proposed development and assesses the likely impacts of the scheme on the receiving environment, in terms of both townscape character and visual amenity.

Landscape/Townscape Impact Assessment (LIA) relates to assessing effects of a development on the Landscape/Townscape as a resource in its own right and is concerned with how the proposal will affect the elements that make up the Landscape/Townscape, the aesthetic and perceptual aspects of the Landscape/Townscape and its distinctive character.

Visual Impact Assessment (VIA) relates to assessing effects of a development on specific views and on the general visual amenity experienced by people. This deals with how the surroundings of individuals or groups of people may be specifically affected by changes in the content and character of views as a result of the change or loss of existing elements of the Landscape/Townscape and/or introduction of new elements. Visual impacts may occur from; Visual Obstruction (blocking of a view, be it full, partial or intermittent) or; Visual Intrusion (interruption of a view without blocking).

14.2 MITIGATION

The main mitigation by avoidance measure employed in this instance is the siting of the proposed development in a robust, appropriately zoned business park that will avail of screening from existing and imminent built form and vegetation to minimise open visibility from within the study area. No other specific landscape and visual mitigation measures are deemed necessary in this instance.

14.3 POTENTIAL EFFECTS

In combination with the Low Landscape/Townscape sensitivity designation outlined above for the site and its immediate environs, the significance of construction stage impacts is deemed to be Slight within the immediate industrial context of the site and its surrounds of Profile Park. However, this will quickly reduce to Imperceptible in the wider study area, where construction activities will be barely discernible. The quality of the construction stage effects will be Negative and Temporary in duration.

Whereas, the significance of operational stage impacts is deemed to be Slight-imperceptible within the immediate industrial context of the site and its surrounds of Profile Park. However, this will reduce to Imperceptible in the wider study area, where operational activity will be barely discernible. The quality of the construction stage effects will be marginally adverse (i.e. Neutral-Negative) due to the wholly utilitarian nature of the substation and Permanent in duration.

Decommission stage works are likely to be similar to those outlined as part of the construction stage, but of a lesser duration. Thus the significance of decommissioning stage impacts is deemed to be Slight within the immediate industrial context of the site and its surrounds of Profile Park. However, this will quickly reduce to Imperceptible in the wider study area, where

decommissioning activities will be barely discernible. The quality of the decommissioning stage effects will be Neutral and Temporary in duration.

Overall, it is considered that the proposed substation development will not result in any significant townscape or visual impacts.

15.0 TRAFFIC AND TRANSPORTATION

15.1 INTRODUCTION

The objective of this chapter is to assess the impact of the proposed substation on the existing road network. This report will calculate the expected volume of traffic that will be generated by the proposed development to connect the nearby and recently approved Gas Fired Peaker Power Plant to the existing electricity transmission system (Reg. Ref.:SD21A/0167) and assesses the impact that this traffic will have on the operational capacity of the local road network. This chapter is summary of a more comprehensive Traffic and Transportation Assessment (TTA) which is included in Appendix 15-1.

15.2 POTENTIAL EFFECTS

Traffic generated by the construction phase primarily consists of traffic related to either delivery of construction materials, or removal of excavated material from the site for disposal. Construction phase staff would also generate trips to and from the construction sites.

Trip Rates for the various uses within the development have been determined for weekdays, Monday to Friday, to coincide with the maximum levels of existing traffic on the adjacent road network. 59 no. vehicles are expected, per day, during the peak construction period and 5 no. vehicles are expected, per day, during the average construction period which over the 12 months. During the busiest time of the construction phase, 10 no people and 59 no. HGVs are expected over the 12-hour construction time during the day which will result in 10 LGVs and 5 HGVs arriving and 5 HGVs departing in the AM peak and in the PM peak 10 LGVs and 5 HGVs departing, and 5 HGVs arriving.

The analysis of the junctions for the construction phase of the proposed development in the AM and PM peaks showed they do not have capacity issues at present and would operate within capacity during the construction phase of the proposed development. The junction assessments indicate that none of the junctions assessed are currently exceeding desirable capacity. This will remain the case during the construction period. The operational traffic for the proposed development is expected to be less than 5 vehicle movements per day. The potential effects of the operation phase on the capacity and operation of the receiving road network are considered to be negligible.

15.3 MITIGATION AND MONITORING MEASURES

Mitigation measures during the construction phase will include another photographic survey of haul roads, immediately prior to the commencement of the construction phase and continuous monitoring of haul roads throughout the construction phase. Throughout the operational phase warning signs on the approach to the entrance will be maintained, the entrance will be maintained to ensure visibility splays remain unobstructed and parking requirements will be monitored with additional spaces to be provided if required.

15.4 RESIDUAL EFFECTS

There will be no residual impacts during the construction phase or decommissioning phase. Mitigation measures that will be taken in the operational phase will ensure imperceptible effect on the traffic capacity.

16.0 MATERIAL ASSETS

16.1 INTRODUCTION

The purpose of this chapter is to describe the methodology used to assess the potential impacts from the proposed Baldonnell Substation and its associated 110kV underground cable, (hereafter referred to as the "proposed development") on the material assets in the study area. The chapter will describe the baseline environment of the material assets in the study area, assess the likely impacts and set out mitigation measures to be put in place to reduce these impacts on the material assets. The chapter considers the impacts on the material assets and not the people using the assets. Material Assets are resources that are valued and that are intrinsic to specific places. These may be economic assets of human or natural origin.

16.2 POTENTIAL EFFECTS

Access will be required to third party properties to allow construction works to be completed for the project. Construction practices will ensure that any effects regarding property accessibility will be minimised.

Traffic on the road network generated by the construction phase of the proposed development will primarily consist of traffic related to either delivery of construction materials, or removal of excavated material from the site for disposal. Construction Phase staff will also generate trips to and from the construction sites. The traffic impact on the road network during the Construction Phase will have slight negative temporary effects. The operational traffic for the proposed development is expected to be less than 5 vehicle movements per day. The potential effects of the Operation Phase on the capacity and operation of the receiving road network are considered to be negligible.

Where roads are opened for the installation of electrical cables or gas pipelines, moderate negative temporary effects are likely to arise on these roads during construction.

The main issue to be addressed at this stage of the project is the use of cranes and to ensure details of same are advised to the Department at least 30 days in advance of usage on site. It should be noted that the Department of Defence has not highlighted any major concerns in relation to this project which cannot be mitigated. It is predicted that there will be a short term, negative and slight impact on aviation during construction.

There are no existing material assets on the site of the proposed substation however there are material assets along the proposed routes associated with the electrical grid connection. However, these assets are development in built up 'made' land. Therefore, an imperceptible negative effect on land-take is predicted.

There are potential surface water quality effects associated with the proposed development which could indirectly impact watercourses. These are discussed above and are set in more detail in chapter see Chapter 9 (Hydrology and Hydrogeology) of Volume II of the EIAR.

Raw materials (e.g., wood, steel, stone, sand etc.) required during the construction phase of the proposed development will be sourced from local suppliers, where possible. However, some of the equipment parts may not be manufactured in Ireland and these will have to be imported. The plant may also require the use of some non-renewable materials. However, consideration will be given to the sustainable sourcing of all raw materials and materials will be reused where possible. Methodologies will be chosen at design stage to decrease the amount of imported

material required. There will be an imperceptible, negative and permanent impact on raw materials as a result of the proposed development.

During its operations phase, the proposed development will operate in accordance with its Industrial Emissions Licence and an emissions or effects on its nearest receptors will be regulation by the Environmental Protection Agency in accordance with same. There will be imperceptible, brief effects on the road network during the operational phase.

he national distribution and transmission system operated by ESB Networks and EirGrid and the national gas network operated by GNI would facilitate these connections subject to commercial agreement. The proposed substation will facilitate the transmission of power to the grid to support renewable energy integration. Therefore, the proposed substation along with the associated gas fired power plant would have a positive and long-term effect on public utilities..

16.3 MITIGATION AND MONITORING MEASURES

16.3.1 Construction

There are no mitigation measures relating to existing properties outside of Profile Park. Within Profile Park effects on the neighbouring Digital Realty data centre will be mitigated in accordance with the Construction Environmental Management Plan.

The proposed works will require the crossing of road infrastructure and the opening of the road to lay underground electrical cables and a gas pipelines. Chapter 15 (Traffic and Transport) details specific mitigation measures to be undertaken during the construction phase to eliminate and reduce any impacts on the road network.

During the project detailed design stage, further consultation will be undertaken with all communication utility providers to confirm the current locations of their infrastructure. This information will be considered in the detailed design of the project and the infrastructure avoided where possible.

While it is unlikely that any cranes used during construction will reach the aerodrome's Inner Horizontal Surface, it will be necessary [under S.I. 215 of 2005 – 'Irish Aviation Authority (Obstacles to Aircraft in Flight) Order'] for prior notification of the use of any crane/s to be submitted, at least 30 days in advance, to the Irish Aviation Authority and to Casement Aerodrome (through the Department of Defence).

Mitigation measures for the protection of watercourses are detailed in Chapter 9 (Hydrology & Hydrogeology) and will be adhered to throughout the construction phase.

Consideration will be given to the sustainable sourcing of all materials. Materials will be reused where possible. The methodologies chosen at design stage, will result in a decrease in the amount of imported material, which in turn will reduce the impact of traffic on the surrounding roads and will result in less demand on non-renewable sources such as quarries.

16.3.2 Operation

There are no mitigation and monitoring measures required during the operation of the proposed Baldonnell Substation.

16.4 RESIDUAL EFFECTS

The material assets identified in the study area are considered to be typical infrastructure frequently encountered in civil engineering infrastructure projects, in both rural and urban environments. As such, it is considered that the resulting predicted effects on material assets from the proposed substation will be positive, slight and permanent.

17.0 MAJOR ACCIDENTS

17.1 INTRODUCTION

This chapter assesses the potential for significant effects on the environment arising from the vulnerability of the proposed substation to risks of major accidents and/or disasters, given the location of the proposed substation and connection to the adjacent gas fired power plant.

17.2 POTENTIAL EFFECTS

This chapter examines the potential for major accidents and disasters in the context of the proposed development at Profile Park, with regards to:

- The likelihood of the proposed substation to act alone and/or to interact with the gas fired power plant to act as a source of hazard;
- The relevant major accidents and/or disasters, if any, that the adjacent and associated gas fired power plant could be vulnerable through the construction, operation and decommissioning phases;
- The potential for these major accidents and/or disasters to result in likely significant adverse environmental effect(s); and
- The measures that are in place, or need to be in place, to prevent or mitigate the likely significant adverse effects of such events on the environment.

17.3 MITIGATION AND MONITORING MEASURES

The proposed substation will be designed and constructed in line with good industry practice, and, as such, mitigation against the risk of major accidents and/or disasters will be embedded through the design and in accordance with planning and Industrial Emissions Licence requirements.

17.4 RESIDUAL EFFECTS

The residual risk of a major accident or disaster occurring during either the construction, operation or decommissioning phased of the project is either very low or low.

18.0 INTERACTIONS OF THE FOREGOING

The potential effects of the proposed Baldonnell 110kV substation and the measures proposed to mitigate these effects have been outlined in this EIAR. However, in any development with the potential for environmental effect there is also the potential for interaction between effects of the different environmental aspects.

The result of these interactions may either exacerbate the magnitude of the effect or may in fact ameliorate it. As part of the requirements of an EIAR, the interaction of the effects on the surrounding environment needs to be addressed.

Table 18-1 outlines the different environmental aspects which have potential to interact as a result of the proposed Baldonnell Substation. Interactions have been clearly identified in the early stages of the project and where the potential exists for interaction between environmental impacts, the EIAR specialists have taken the interactions into account when making their assessment. Potential interactions (both positive and negative) have been considered for the construction, operation and decommissioning phases of each of the different environmental aspects. It is noted that the operational life of the proposed development is expected to be at least 25 no. years and consideration has been made for the full duration of this time period with regards to an assessment of potential impacts and interactions.

Table 18-1: Interaction between Environmental Topic (positive and negative)

trix Corresponding Topic Heading Interaction No Interaction	Population and Human Health	Land, Soils and Geology	Hydrology and Hydrogeology	Air Quality and Climate	Noise and Vibration	Biodiversity	Cultural Heritage	Landscape / Townscape and Visual	Traffic and Transport	Material Assets	Major Accidents and Disasters
Population and Human Health											
Land, Soils and Geology											
Hydrology and Hydrogeology											
Air Quality and Climate											
Noise and Vibration											
Biodiversity											
Cultural Heritage											
Landscape / Townscape and Visual											
Traffic and Transportation											
Material Assets											
Major Accidents and Disasters											

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EIAR

1.0 INTRODUCTION

1.1 BACKGROUND

Greener Ideas Limited is proposing to construct a 110kV electrical substation (hereafter referred to as the "Baldonnell Substation") and associated grid connection at a site located in Profile Park, Dublin 22. The proposed substation is being developed to provide a connection for the adjacent gas fired peaker power plant to the existing electricity transmission system. The gas fired power plant will have a capacity to generate up to 102MW of electricity.

Electrical power will be exported from the power plant's main transformers through the proposed Baldonnell Substation to the existing Barnakyle 110kV substation, which is operated by EirGrid and owned by ESB. The associated grid connection works will consist of underground cabling.

The associated gas fired peaking power plant will operate when electricity demand is higher than average, typically during morning and evening peak usage times. The plant will regularise energy provision in the electricity grid especially in the context of an increase in use of renewable energy technologies, such as wind and solar power. The plant technology allows the delivery of an efficient, safe and secure electricity system by helping to manage fluctuating electricity demands and compensate for shortages occurring from wind or solar power. This will accommodate and support Ireland's transition to a low-carbon economy and mean that Ireland can continue to invest in renewable sources of power in order to meet future national and EU targets. The design of the plant and its ultimate usage is flexible such that it may provide power directly to the national electricity grid. Natural gas, supplied from the Gas Networks Ireland national grid, will be the primary fuel source for the plant.

Information on the design of the proposed Baldonnell Substation is provided in Chapter 3 'Description of Development'. The key design characteristics will include:

- EirGrid/ ESBN Control Room building
- Associated Internal 15kV and 110kV Underground Cabling
- Installation of a 15/110kV Transformer (TRAFO) with associated 110kV switchgear equipment including:
    - Cable Sealing End
    - Surge Arrestor
    - Earth Disconnect
    - Current /Voltage Transformer
    - House Transformer
    - Circuit Breaker
- 110kV underground cable to Barnakyle 110kV substation 3 No Power Ducts and 2 No Telecoms Ducts.
- Diesel Generator
- Security Fencing, Security Cameras and Poles
- Lights/Lamp Poles
- Lightning Masts
- Temporary Construction Compound

- And all other associated site development plant and equipment and other works including surface water and foul wastewater drainage, within an overall redline boundary measuring approximately 2.6 hectares.

Natural gas, supplied from the Gas Networks Ireland national grid, will be the primary fuel source for the gas fired power plant. However, in order to comply with Commission for Regulation for Utilities (CRU) requirements for security of energy supply, the gas fired power plant will also have capacity to operate on low sulphur diesel oil as a backup fuel in the event of interruption to the natural gas supply.

This Environmental Impact Assessment (EIA) Report has been prepared in order to inform the planning application for the proposed Baldonnell Substation, which has been submitted to An Bord Pleanála for statutory approval. It should be noted that the application seeks a 10-year planning permission.

1.2 APPLICANT

Greener Ideas Limited (GIL) is a joint venture company comprising of Bord Gáis Energy and Mountside Properties Limited. GIL is developing a portfolio of energy projects and has secured planning permission for gas fired power plants and battery energy storage plants in Kilkenny, Tipperary and Roscommon. It is envisaged that these plants will make a significant contribution towards Irelands renewable energy targets for 2030 and beyond as they will help regularise the electricity grid and facilitate additional renewables integration onto the grid in line with EirGrid's DS3 Programme (refer Section 4.4.1).

Bord Gáis Energy (BGE) has been in operation in Ireland since 1976. Today, BGE provides gas, electricity and home care services to over 730,000 residential and business customers throughout the country. It operates the 445 MW Combined Cycle Gas Turbine (CCGT) power plant in Whitegate, County Cork. BGE's sustainable principles include:

- To provide products and services to customers that support a low carbon future;
- To support the creation of a sustainable low carbon energy system for Ireland; and
- To strive for a net zero internal carbon footprint from our own corporate operations.

In 2014, BGE became part of the global Centrica plc Group. Centrica is a leading international energy services and solutions provider. Centrica supplies energy and services to over 26.2 million customer accounts mainly in Ireland, the UK and North America through its brands including BGE, British Gas and others.

Mountside Properties Limited are shareholders in the operation of the 400 MW CCGT power plant in Tynagh, County Galway.

1.3 SITE LOCATION

The site of the proposed Baldonnell Substation is located in Profile Park, Dublin 22. This is a 100 acre (40.5 Ha) fully enclosed, private business park which has been developed to the highest of standards. It is easily accessible from the major arterial roads in the city including the M50, M7 and M4, and is served by excellent public transport links.

Within Profile Park the proposed substation will be located on greenfield lands immediately adjacent to the associated gas fired power plant, and near to the existing Digital Realty data centre. The proposed Kilcarbery Substation will be located along the western boundary of the proposed Baldonnell Substation site.

The site of the proposed substation has been identified by South Dublin County Council in its County Development Plan 2022-2028 as Zoning Objective 'EE' which is 'To provide for enterprise and employment related uses'. The siting of a power plant and proposed substation together in Profile Park would bring additional opportunity to further accommodate data centre development. In this context it should be noted that Profile Park is connected directly onto the Dublin metropolitan fibre network called the T50. The T50 is a multi-duct fibre carrying system which extends over 44 km and provides connectivity to 24 business parks and from these into the global networks through.

Existing tenants within Profile Park and the surrounding business and enterprise parks include Google, Microsoft, Digital Realty Trust, Telecity and others. Immediately adjacent to Profile Park is the Castlebaggot 110 / 220 kV substation which provides electrical transmission connectivity to the national electricity transmission grid system.

The nearest residential properties are located some 400m to the south of the site and some 450 m to the north east. Grange Castle Golf Course is located approximately 120m east of the site and Baldonnell Aerodrome 450m south of the site.

The proximity to the transmission grid, natural gas connections and local data centre development are key drivers for the siting of the gas fired power plant and associated proposed substation. The location of the proposed Baldonnell Substation is indicated on Figure 1-1 and Figure 1-2.

1.4 LAND OWNERSHIP

Greener Ideas Ltd. is the owner of the site on which the proposed substation will be located, with different ownership titles for the grid connection route.

Documentary evidence in relation to the owner's consent for the submission of the planning application for the proposed development to An Bord Pleanála has been provided with the planning application documentation.

1.5 STATUTORY CONSENT OVERVIEW

1.5.1 Proposed Baldonnell Substation Consenting Process

Under the strategic infrastructure provisions of the Planning Acts, electricity transmission development referred to in section 182A(1) is strategic infrastructure development (SID).

Section 182A (1) to (3) and subsection (9) of the Planning Acts provide as follows:

1) *Where a person (hereafter referred to in this section as the 'undertaker') intends to carry out development comprising or for the purposes of electricity transmission, (hereafter referred to in this section and section 182B as 'proposed development'), the undertaker shall prepare, or cause to be prepared, an application for approval of the development under section 182B and shall apply to the Board for such approval accordingly.*
2) *In the case of development referred to in subsection (1) which belongs to a class of development identified for the purposes of section 176, the undertaker shall prepare, or cause to be prepared, an environmental impact statement or Natura impact statement or both of those statements, as the case may be, in respect of the development.*
3) *The proposed development shall not be carried out unless the Board has approved it with or without modifications. […]*

9) *In this section 'transmission', in relation to electricity, shall be construed in accordance with section 2(1) of the Electricity Regulation Act 1999 but, for the purposes of this section, the foregoing expression, in relation to electricity, shall also be construed as meaning the transport of electricity by means of—*
   a. *a high voltage line where the voltage would be 110 kilovolts or more, or*
   b. *an interconnector, whether ownership of the interconnector will be vested in the undertaker or not.*

"Transmission" is defined in subsection 2(1) of the Electricity Regulation Act 1999 as follows:

"transmission", subject to section 2A, in relation to electricity, means the transport of electricity by means of a transmission system, that is to say, a system which consists, wholly or mainly, of high voltage lines and electric plant and which is used for conveying electricity from a generating station to a substation, from one generating station to another, from one substation to another or to or from any interconnector or to final customers but shall not include any such lines which the Board may, from time to time, with the approval of the Commission, specify as being part of the distribution system but shall include any interconnector owned by the Board.

"electric plant" is defined as follows:

"*any plant, apparatus or appliance used for, or for purposes connected with, the generation, transmission, distribution or supply of electricity, other than—*
a) an electric line,
b) a meter used for ascertaining the quantity of electricity supplied to any premises, or
c) *an electrical appliance under the control of a consumer".*

The applicant entered into pre-application consultation with An Bord Pleanála in relation to the proposed 110kV electrical substation and its grid connection (Ref: ABP-312984-22). An Bord Pleanála has confirmed that the proposed Baldonnell Substation falls within the scope of section 182A of the Planning and Development Act 2000, as amended and is therefore Strategic Infrastructure Development (SID). Please refer to Appendix 1-1 for a copy of the SID Determination.

1.5.2 Gas Fired Power Plant Consenting Process

It should be noted that the associated gas fired power plant received planning permission from South Dublin County Council on the 30th of August 2022, with 17 conditions attached (Reg. Ref.: SD21A0167).

1.6 STRUCTURE OF EIA REPORT

The structure of this EIA Report is set out in Table 1-1 below:

Table 1-1: Structure of EIA Report

Chapter No.	Chapter Title
1	Introduction
2	EIA Report Methodology
3	Description of Development
4	Need for the Development
5	Consideration of Alternatives
6	Planning
7	Population and Human Health
8	Land, Soils and Geology
9	Hydrology and Hydrogeology
10	Air Quality and Climate
11	Noise and Vibration
12	Biodiversity
13	Cultural Heritage
14	Landscape, Townscape and Visual
15	Traffic and Transportation
16	Material Assets
17	Major Accidents
18	Interactions of the Foregoing

6°33'0"W 6°30'0"W 6°27'0"W 6°24'0"W 6°21'0"W

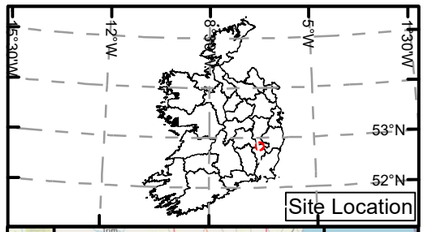
53°21'0"N 53°18'0"N

736600 733200 729800 726400

695500 699000 702500 706000 709500

N

Site Location



Legend

- Planning Application Boundary
- Ownership Boundary

0 0.5 1 1.5 2
Kilometers

NOTES

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

Rev	Date	Description	By	Chkd.
A	23/05/2023	Final issue	S.P	C.N

Client: Greener Ideas

Project:

Profile Park power plant - Substation Application

Title:

Figure 1-1:
Regional Site Location Plan

Scale @ A3: 1:50,000

Prepared by:	Checked by:	Date:
S.Pezzetta	C.Naughton	May 2023

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Map Ref: 11069-001-S.BO-Reg-TOB-A

Draft: A

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6°27'0"W

6°26'0"W

53°19'0"N

731200

730400

729600

N

Clutterland

Milltown Cross

Milltown

Ballybane

Blundelstown Cross

Aungierstown and Ballybane

Kilcarbery

Priest Town

Kilmactalway

Kilbride

Baldonnel Lower

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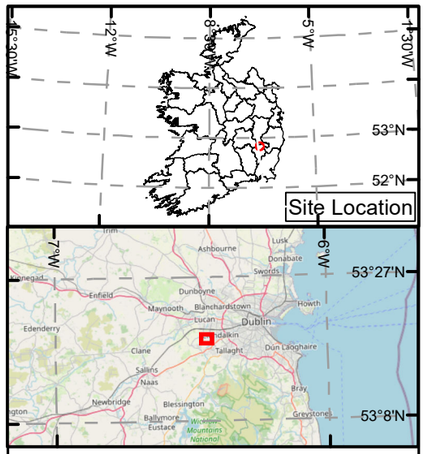

Legend

- Planning Application Boundary
- Ownership Boundary

0 100 200 300 400

Meters

NOTES

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

Rev	Date	Description	By	Chkd.
A	23/05/2023	Final issue	S.P	C.N

Client: Greener Ideas

Project:

Profile Park power plant - Substation Application

Title:

Figure 1-2:
Site Location Plan

Scale @ A3: 1:8,000

Prepared by:	Checked by:	Date:
S.Pezzetta	C.Naughton	May 2023

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Draft: A

2.0 EIA REPORT METHODOLOGY

2.1 INTRODUCTION

This chapter presents an outline of the methodology to be employed for the proposed Baldonnell Substation. It outlines the methodology for the identification and evaluation of potential likely significant environmental effects and also presents the methodology for the identification and evaluation of potential cumulative and interrelated impacts.

As set out in Chapter 1 (Introduction), the proposed substation is being developed to provide a connection for the adjacent gas fired power plant to the existing electricity transmission system. The gas fired power plant will have a capacity to generate up to 102MW of electricity.

2.2 REQUIREMENT FOR ENVIRONMENTAL IMPACT ASSESSMENT

2.2.1 EIA Directive Context

The primary objective of the of the Environmental Impact Assessment Directive (Council Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment as amended by Directive 2014/52/EU (EIA Directive), is to ensure a high level of protection of the environment and human health, through the establishment of minimum requirements for environmental impact assessment (EIA), prior to development consent being awarded, of public and private developments that are likely to have significant effects on the environment.

Directive 2014/52/EU provides a definition of environmental impact assessment as being a process consisting of:

- The preparation of an environmental impact assessment report (EIAR);
- The carrying out of consultations required to inform the EIAR;
- The examination by the competent authority of the information presented in the EIAR and any supplementary information provided, where necessary, by the developer and relevant information received through consultations with the public, prescribed bodies and any affected Member States;
- The reasoned conclusion by the competent authority on the significant effects of the project on the environment; and
- The integration of the competent authority's reasoned conclusion into any development consent decision.

The EIA Directive is transposed into Irish legislation via European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 and the Planning and Development Acts and Regulations 2000 to 2021.

2.2.2 EIA and Planning Legislation in Ireland

In determining the requirement for EIA, the Directive and its transposing legislation in Ireland differentiates between the projects that always require EIA and those for which an EIA may be required. These projects are listed in Schedule 5 Part 1 and Part 2 of the Planning and Development Regulations 2001, as amended (hereafter referred to as 'the Panning Regulations').

Schedule 5, Part 1 Projects, are projects which are considered as having significant effects on the environment and require an automatic EIA.

Schedule 5, Part 2 Projects, are projects where national authorities have to decide whether an EIA is needed. This is done by the "screening procedure", which determines the effects of projects on the basis of thresholds/criteria or a case-by-case examination. The projects listed in Part 2 are in general those not included in Part 1 which may be considered to have a lesser environmental impact.

2.2.3 EIA Screening

An Environmental Impact Assessment (EIA) Report was prepared in order to inform the planning application for the associated gas fired power plant (Reg, Ref.: SD21A/0137). This received planning approval from South Dublin County Council on the 19th of July 2022. It should be noted that the application sought a 10-year planning permission. The EIA Report was also prepared in support of Industrial Emissions license application to the Environmental Protection Agency.

In the context of the gas fired power plant, the most relevant project type identified in Schedule 5 is Part 1 Paragraph 2(a) which relates to:

> *'A thermal power station or other combustion installation with a heat output of 300 megawatts or more.*

The power plant will have a capacity to generate up to 102MW of electricity. This heat output is substantially lower than the 300 MW threshold identified in Paragraph 2(a) and so therefore an automatic EIA was not required. However, on the basis of discussions with South Dublin County Council and on a precautionary basis also having regard to other power plant projects in the Council area, it was agreed to prepare an EIA Report in support of the planning application.

By association, an EIAR has been prepared to inform the planning application for the proposed Baldonnell Substation.

2.3 EIA GUIDANCE

The EIA Report methodology draws upon a number of EIA principles, regulations and guidance documents, including:

- Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, May 2022);
- Draft Guidelines on the Information to be contained in Environmental Impact Statements (EPA, September 2015);
- Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, August 2017);
- Draft Advice Notes on Preparing Environmental Impact Statements" (EPA, September 2015);
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (DHPLG, 2018);
- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017);
- Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment, (European Commission, 2013); and

- Receptor specific guidance documents (e.g., Ecological Impact Assessment (EcIA) guidance issued by the Chartered Institute of Ecology and Environmental Management (CIEEM).

2.4 EIA REPORT CONSULTATIONS

The EIA Report Scoping and consultation activities were carried out in accordance with all relevant guidance documents as set out in Section 2.3.

Scoping is a process of deciding what information should be contained in an EIAR and what methods should be used to gather and assess that information. The purpose of scoping for the EIAR is to provide a framework for the approach to be taken by the individual specialists in carrying out their evaluations, identifying environmental aspects for which potential significant environmental impacts may arise. It also provides a framework for the consultation process and sets out the intended structure of the Final EIAR.

2.4.1 Consultation with An Bord Pleanála

A pre-application consultation meeting was held with An Bord Pleanála on the 5th May 2022 under section 182E of the Planning and Development Act 2000, as amended (Ref: ABP-312984-22).The purpose of the meeting was to initiate the consultation process to determine if the proposed development falls within the scope of section 182A of the Planning and Development Act, 2000 as amended and is considered to be strategic infrastructure development (SID).

The pre-consultation meeting also allowed for the introduction of the proposed development and discussion of the same.

The meeting was attended by the Applicant, Greener Ideas Limited and TOBIN representatives. The meeting discussion was centred around the following key points:

- Client and EIAR / Planning Team;
- Site Context;
- Policy Context;
- Electrical Connection;
- Indicative Layout;
- Key Planning Application Considerations; and
- Next Steps.

A presentation was given providing information on the site and the proposed substation.

Following consultation with An Bord Pleanála under section 182E of the Planning and Development Act 2000, as amended it has been confirmed that the board is of the opinion that the proposed development falls within the scope of section 182A of the Planning and Development Act, 2000 as amended and as such the proposed development is strategic infrastructure development (SID). The relevant consents process for the approval of the proposed development is to submit a planning application directly to An Bord Pleanála under Section 182A(1) of the Act. A copy of this determination is provided in Appendix 1-1 of this report.

Consultation with Statutory and Non-Statutory Bodies

EIAR scoping correspondence was submitted to relevant statutory and non-statutory bodies in December 2022 (by email) for review and comment. The list of consultees and a record of consultation is provided in Table 2-1

Table 2-1: List of Consultees and Record of Consultations

Consultee	Consultation Date	Date of Response	Summary of Comments Received	Project Team Response to Comments Received
South Dublin County Council	20th December 2022	No response received	N/A	N/A
Environmental Protection Agency (EPA)	8th December 2022	No response received	N/A	N/A
An Taisce The National Trust for Ireland	8th December 2022	08th December 2022	Acknowledged receipt of consultation.	N/A
Commission for Communications Regulation (ComReg)	8th December 2022	8th December 2022	Automated response received.	N/A
Commission for Energy Regulation	8th December 2022	No response received	N/A	N/A
Department of Tourism, Culture, Arts, Gaeltacht, Sport and Media	8th December 2022	No response received	N/A	N/A
Department of Defence	8th December 2022	8th December 2022	Response received and redirected to Planning Section. No further response received.	N/A
Department of the Environment, Climate and Communications	8th December 2022	08th December 2022	Email response redirecting to new contact email Department of Environment, Climate and Communications. No further response received.	N/A
Department of the Enterprise, Trade and Employment	8th December 2022	09th December 2022	Acknowledged receipt of consultation and forwarded for attention of paul.gavin@ida.ie	N/A
Minister for Communications, Energy and Natural Resources	8th December 2022	No response received	N/A	N/A
National Parks and Wildlife Services	8th December 2022	No response received	N/A	N/A
Department of Housing, Local Government and Heritage	8th December 2022	9thDecember 2022	Acknowledged receipt of consultation. Normal	

Consultee	Consultation Date	Date of Response	Summary of Comments Received	Project Team Response to Comments Received
		30th January 2022	Response provided outlined that as part of EIA requirements you are obliged to retain the services of a Consultant Archaeologist to carry out the Archaeological Impact Assessment (AIA) as part of the overall Cultural Heritage Impact Assessment (CHIA) of the proposed development, which should be integrated into the finalised Environmental Impact Assessment Report (EIAR). In this regard the Department awaits the results of the CHIA and full EIAR for the scheme before commenting further.	CH 13 Cultural Heritage
Eastern and Midland Regional Assembly	8th December 2022	No response received	N/A	N/A
Enterprise Ireland	8th December 2022	No response received	N/A	N/A
Fáilte Ireland	8th December 2022	No response received	N/A	N/A
Gas Networks Ireland	8th December 2022	9thDecember 2022	Response attached network map for the area of interest. Gas Networks Ireland has Distribution Gas Network within your area of interest. Before you start work, you must have a current gas network map (or maps) for the work location. A current gas network map (or maps) must always be kept on site while work is under way. The gas network map is indicative only. You must conform to the safety and legal notices printed on the map. For further information on reading this map refer to the ***Safety Information.*** **Breaking Ground** • Supervision by Gas Networks Ireland is **not** required when working in the vicinity of Distribution gas pipes (unless noted otherwise). Safe digging practices **must** be followed. All work in the vicinity of a gas transmission pipeline **must** be carried out in compliance with: ○ Health and Safety Authority, ***Code of Practice for Avoiding Danger from Underground Services.*** ○ **Critical Activity** **Quarrying or blasting** must not be carried out within 400 m of the gas network until Gas Networks Ireland has been consulted on **1800 42 77 47** **Aurora Telecom** ○ Part of the Aurora Telecom Network may be present on your network map. For further information, Aurora can be contacted on **01 892 6166** (Office Hours) or auroralink@gasnetworks.ie. **Service Pipes**	

Consultee	Consultation Date	Date of Response	Summary of Comments Received	Project Team Response to Comments Received
			○ Service pipes feeding individual properties are not generally shown but their presence should always be anticipated. For further information on domestic gas services refer to the ***Safety Information.*** **Safety Information** ○ Before starting work any work in the vicinity of the gas network, please refer to the Gas Networks Ireland safety booklet, ***Safety advice for working in the vicinity of natural gas pipelines***, available at https://www.gasnetworks.ie/home/safety/dial-before-you-dig/ This booklet contains important safety information, including advice on how to read the gas network maps you have requested.	
Geological Survey of Ireland (GSI)	8th December 2022	No response received	N/A	N/A
Health and Safety Authority (HSA)	8th December 2022	9thDecember 2022	Automated response acknowledged receipt of consultation.	N/A
IDA Ireland	8th December 2022	9thDecember 2022	We aim to answer your query within 48 hours.	N/A
Inland Fisheries Ireland (IFI)	8th December 2022	No response received	N/A	N/A
Irish Water	8th December 2022	No response received	N/A	N/A
Office of Public Works (OPW)	8th December 2022	N/A	Automated response acknowledged receipt of consultation. If you do not receive a response within 20 working days, please email this address again for further assistance (info @opw.ie)	N/A
Heritage Council	8th December 2022	No response received	N/A	N/A
Transport Infrastructure Ireland	8th December 2022	23rd December 2022	The recommendations indicated below provide only general guidance for the preparation of an EIAR, which may affect the national road network. The developer/scheme promoter should have regard, inter alia, to the following: • Consultations should be had with the relevant Local Authority/National Roads Design Office with regard to locations of existing and future national road schemes, • TII would be specifically concerned as to potential significant impacts the	

Consultee	Consultation Date	Date of Response	Summary of Comments Received	Project Team Response to Comments Received
			development would have on the national road network (and junctions with national roads) in the proximity of the proposed development, • The developer should assess visual impacts from existing national roads, • The developer should have regard to any Environmental Impact Statement and all conditions and/or modifications imposed by An Bord Pleanála regarding road schemes in the area. The developer should in particular have regard to any potential cumulative impacts, • The developer, in conducting an Environmental Impact Assessment, should have regard to TII Publications (formerly DMRB and the Manual of Contract Documents for Road Works), • The developer, in conducting an Environmental Impact Assessment, should have regard to TII's Environmental Assessment and Construction Guidelines, including the Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes (National Roads Authority, 2006), • The EIAR should consider the Environmental Noise Regulations 2006 (SI 140 of 2006) and, in particular, how the development will affect future action plans by the relevant competent authority. The developer may need to consider the incorporation of noise barriers to reduce noise impacts (see Guidelines for the Treatment of Noise and Vibration in National Road Schemes (1st Rev., National Roads Authority, 2004)), • It would be important that, where appropriate, subject to meeting the appropriate thresholds and criteria and having regard to best practice, a Traffic and Transport Assessment (TTA) be carried out in accordance with relevant guidelines, noting traffic volumes attending the site and traffic routes to/from the site with reference to impacts on the national road network and junctions of lower category roads with national roads. TII's Traffic and Transport Assessment Guidelines (2014) should be referred to in relation to proposed development with potential impacts on the national road network. The scheme promoter is also advised to have regard to Section 2.2 of the NRA/TII TTA Guidelines which addresses requirements for sub-threshold TTA, • The designers are asked to consult TII Publications to determine whether a Road Safety Audit is required, • In the interests of maintaining the safety and standard of the national road network, the EIAR should identify the methods/techniques proposed for any works traversing/in proximity to the national road network,	

Consultee	Consultation Date	Date of Response	Summary of Comments Received	Project Team Response to Comments Received
			• In relation to haul route identification, the applicant/developer should clearly identify haul routes proposed and fully assess the network to be traversed. Separate structure approvals/permits and other licenses may be required in connection with the proposed haul route, including where temporary modification to the road network may be required. Consultation with relevant PPP Companies and MMaRC Contractors may also be required. All structures on the haul route should be checked by the applicant/developer to confirm their capacity to accommodate any abnormal load proposed, including abnormal weight load, • In relation to cabling and potential connection routing, the scheme promoter should note locations of existing and future national road schemes and develop proposals to safeguard proposed road schemes. In the context of existing national roads, alternatives to the provision of cabling along the national road network, such as alternative routing or the laying of cabling in private lands, should be considered in the interests of safeguarding the investment in and the potential for future upgrade works to the national road network. The cable routing should avoid all impacts to existing TII infrastructure such as traffic counters, weather stations, etc. and works required to such infrastructure shall only be undertaken in consultation with and subject to the agreement of TII, any costs attributable shall be borne by the applicant/developer. The developer should also be aware that separate approvals may be required for works traversing the national road network and motorway network. Notwithstanding any of the above, the developer should be aware that this list is non-exhaustive, thus site and development specific issues should be addressed in accordance with best practice.	

2.5 EIA REPORT PRODUCTION

2.5.1 Characterisation of the Baseline Environment

A characterisation of the existing environment and its likely evolution in the absence of the project has been undertaken in order to determine the baseline conditions. This involved the following steps:

- Study areas defined for each receptor type based on the relevant characteristics of the receptors (mobility / range);
- Review information available from official sources, public sources and consultation;
- Review likely or potential impacts that might be expected to arise from the project;
- Determine if there is sufficient data to identify, describe, evaluate and assess the impacts of the project with sufficient confidence;
- If further data is required, ensure data gathered is targeted and directed at answering the key questions and filling key data gaps; and
- Review information gathered to ensure the environment can be characterised in sufficient detail.

2.5.2 Consideration of Alternatives

The EIA Directive requires that the EIAR provides a description of the reasonable alternatives studied, which are relevant to the project and its specific characteristics. An indication of the main reason for selecting the chosen option (the project), including a comparison of the environmental effects will be provided within the EIAR.

This approach will include an assessment of:

- Alternative Sites: This will outline the consideration given to other land banks and the assessment that was undertaken to identify the final proposed site locations for the onshore infrastructure;
- Alternative Layouts / Design: This will detail how the arrangement of site infrastructure within a site was considered and where environmental issues have informed final proposed layouts;
- Alternative Technology / Processes: This will detail the consideration of other technology/processes that was undertaken taking into account aspects such as the needs and scale of the project and site location details.

2.5.3 Description of Significant Effects

The approach taken to make balanced assessments is guided by both EIA specialists and technical specialists using publicly available and official data, new data gathered for the purposes of the EIAR, experience and expert judgment. In order to provide a consistent framework and system of common tools and terms, where appropriate, a matrix approach has been used to frame and present the judgments made. However, it should be noted that for each topic of the EIA the latest guidance or best practice has been used and therefore definitions of sensitivity and magnitude of impact have been tailored to each receptor. The impact assessment considers the potential impacts during the construction, operation and decommissioning of the proposed Baldonnell Substation.

The EIA Report has been completed in accordance with the requirements of Directive 2011/92/EU, the Planning and Development Act 2000 to 2020 and the Planning and Development Regulations 2001 to 2021, with the information contained within the EIAR

adhering to the requirements of Schedule 6 of the Regulations (Information to be Contained in EIAR)

The methodology used in preparing the EIAR comprises the following steps:

- A description of the project comprising information on the site, design, size and other relevant features of the project;
- A description of the likely significant effects of the project on the environment;
- A description of the features of the project and/or measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment; and
- Any additional information relevant to the specific characteristics of a particular project or type of project and to the environmental features likely to be affected.

The methodology is broadly consistent across all chapters of the EIAR and is adhered to as much as possible, in order to ensure that the assessment methodology is transparent and can be effectively communicated to, and understood by, all planning and environmental stakeholders, and the general public. The schematic below from the EPA's Guidelines on the Information to be contained in Environmental Impact Assessment Reports (May 2022) provides an overview of the steps undertaken in the preparation of this EIAR.

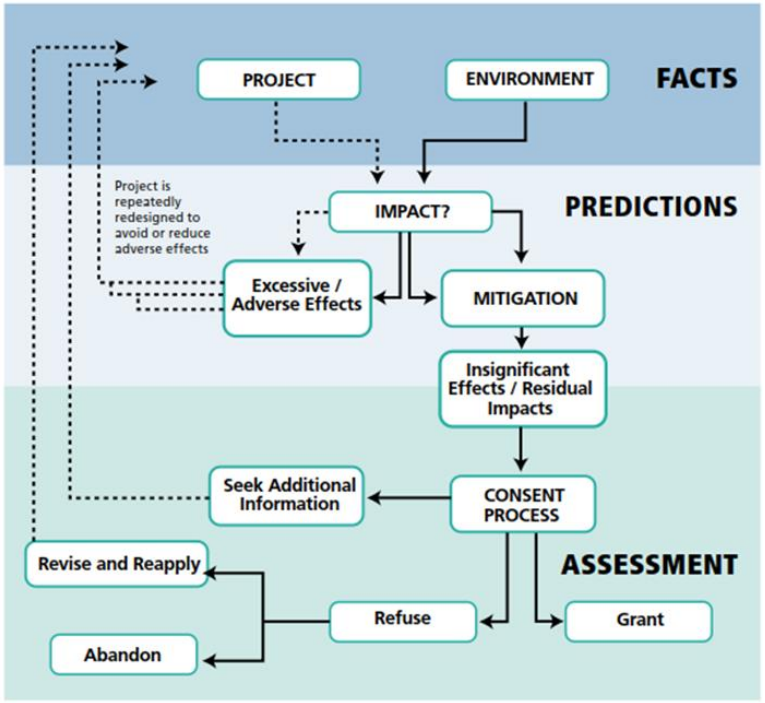

Figure 2-1: EIA Process

The EIAR includes (to an appropriate degree of detail) a description of:

- The location of the project and the physical characteristics of the whole project, including, and the land-use requirements during construction and operation;
- The main characteristics of the operational phase of the project (production and maintenance processes in particular), for example energy demand, energy used, nature and quantity of materials and natural resources (including water, land, soil, biodiversity, etc.,) used;
- An estimate, by type and quantity, of the expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, etc., and quantities and types of waste produced during the construction and operational phases; and

- The reasonable alternatives which are relevant to the project and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects;
- The relevant aspects of the baseline environment, an outline of the likely evolution thereof without the project;
- The likely significant effects of the project on the environment accounting for construction of the project, the use of natural resources, emission of pollutants, risks to human health, cultural heritage and the environment;
- Of the expected significant adverse effects on the environment of the project deriving from its vulnerability to risks of major accidents and/or disasters which are relevant to it;
- The cumulation of effects with other existing or approved developments, or both;
- The impact of the project on climate and vulnerability of the project to climate change;
- Of the likely significant effects and methods used to identify and assess significant effects on the environment, including details of any difficulties;
- The measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements

All of the data collected as part of the preparation of this EIAR is relevant to the specific study area defined for each individual chapter. The data requirements for each environmental topic have been determined by technical specialists and is driven by relevant legislation, guidelines, planning and environmental policy requirements and the submissions and observations provided in response to consultation undertaken in support of preparing the EIAR.

2.5.4 Assessment of Significant Effects

As stated in the "Guidelines on the Information to be contained in Environmental Impact Assessment Reports' (EPA, May 2022), an assessment of the likely significant effects of a project is a statutory requirement of the EIAR process. The criteria for the presentation of the characteristics of potential significant effects will be described with reference to the magnitude, spatial extent, nature, complexity, probability, duration, frequency, reversibility, cumulative effect and transboundary nature (if applicable) of the effect.

The classification and description of effects in the EIAR follows the terms provided in Table 3-4 of the EPA Guidelines (2022) referenced above (and duplicated in Table 2-2 in this EIAR). According to the Guidelines, the relevant terms listed in the table below can be used to consistently describe specific effects, but all categories of terms do not need to be used for every effect.

The use of standardised terms for the classification of effects ensures that the EIAR employs a systematic approach, which can be replicated across all disciplines covered in the EIAR. The consistent application of terminology throughout the EIAR facilitates the assessment of the project on the receiving environment.

Table 2-2: Extracted from the EPA Guidelines (2022)

Quality of Effects It is important to inform the non-specialist reader whether an effect is positive, negative or neutral	Positive Effects A change which improves the quality of the environment (for example, by increasing species diversity; or the improving reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).

	Neutral Effects No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
	Negative/adverse Effects A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem, or damaging health or property or by causing nuisance).
Describing the Significance of Effects 'Significance' is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful (also see Determining Significance).	Imperceptible An effect capable of measurement but without significant consequences.
	Not significant An effect which causes noticeable changes in the character of the environment but without significant consequences.
	Slight Effects An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
	Moderate Effects An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
	Significant Effects An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
	Very Significant An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
	Profound Effects An effect which obliterates sensitive characteristics.
Describing the Extent and Context of Effects Context can affect the perception of significance. It is important to establish if the effect is unique or, perhaps, commonly or increasingly experienced.	Extent Describe the size of the area, the number of sites, and the proportion of a population affected by an effect.
	Context Describe whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?)
Describing the Probability of Effects Descriptions of effects should establish how likely it is that the predicted effects will occur – so that the CA can take a view of the balance of risk over advantage when making a decision.	Likely Effects The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
	Unlikely Effects The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.
Describing the Duration and Frequency of Effects 'Duration' is a concept that can have different meanings for	Momentary Effects Effects lasting from seconds to minutes
	Brief Effects Effects lasting less than a day

different topics – in the absence of specific definitions for different topics the following definitions may be useful.	Temporary Effects Effects lasting less than a year
	Short-term Effects Effects lasting one to seven years
	Medium-term Effects Effects lasting seven to fifteen years
	Long-term Effects Effects lasting fifteen to sixty years
	Permanent Effects Effects lasting over sixty years
	Reversible Effects Effects that can be undone, for example through remediation or restoration
	Frequency of Effects Describe how often the effect will occur. (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually)
Describing the Types of Effects	Indirect Effects (a.k.a. Secondary or Off-site Effects) Impacts on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway.
	Cumulative Effects The addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects.
	'Do-Nothing Effects' The environment as it would be in the future should the subject project not be carried out.
	`Worst case' Effects The effects arising from a project in the case where mitigation measures substantially fail.
	Indeterminable Effects When the full consequences of a change in the environment cannot be described.
	Irreversible Effects When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.
	Residual Effects The degree of environmental change that will occur after the proposed mitigation measures have taken effect.
	Synergistic Effects Where the resultant effect is of greater significance than the sum of its constituents, (e.g. combination of SOx and NOx to produce smog).

2.5.5 Mitigation and Monitoring

Where the impact assessment identified that an aspect of the development was likely to give rise to significant environmental effects, mitigation measures, above and beyond any embedded mitigation incorporated into the assessment process, were considered to avoid effects or reduce them to acceptable levels where possible.

Two types of mitigations were defined within the EIAR:

- Embedded mitigation: measures that are identified and adopted as part of the evolution of the project design or measures otherwise incorporated as controls on the construction or operation of the project: and
- Additional mitigation: measures that are identified as a result of the EIA process to reduce or eliminate any effects that are predicted to be significant, which are subsequently offered as project commitments for inclusions in the conditions of consent.

Monitoring provides assurance that proposed systems are operating as intended. This allow adjustments of operations to be made to ensure continued compliance with consent conditions such as emission limit values, conditions of operation, performance criteria/ indicators and detection of unexpected mitigation failures.

For ease of reference the mitigation measures identified in this EIA Report have been collated and are presented in Appendix 2-1 of this EIAR.

2.5.6 Cumulative Effects

Each technical chapter of the EIAR includes a cumulative assessment which considers the impacts arising from the project alone and cumulatively with and other relevant plans, projects and activities. The following must or should be considered in terms of cumulative impacts:

- Existing projects;
- Projects that have received consent;
- Impacts of the development of existing zoned lands; and
- Future phases or proposals for the project.

In relation to the electrical grid connection and gas connections it should be noted that both connections are referenced throughout the EIAR. Other projects and plans are referenced specifically in the cumulative impacts section of the various chapters comprising this EIAR. These include existing developments within Profile Park (for example Digital Realty and Google) and other consented development which are not yet in operation such as the associated gas fired peaker power plant. Other developments which are located outside of the immediate setting of the proposed Baldonnell Substation which also have the potential to result in cumulative impacts have also been identified. These include for example aviation impacts with Casement Aerodrome and air quality impacts with other power plant projects (which are consented but not yet operational) such as Grange Back Up Power Plant in addition to air quality emission from other Industrial Emissions Licences facilities such as Takeda and Pfizer

2.5.7 Residual Effects

Following the identification of any necessary additional mitigation measures, residual effects were assessed, and their significance described. Monitoring measures are proposed in the EIAR where there is uncertainty regarding the significance of, or the predicted levels of residual effects or where monitoring is necessary to modify control measures on an ongoing basis to control residual effects.

2.6 ASSUMPTIONS AND LIMITATIONS OF ASSESSMENT

Specific assumptions relevant to environmental aspects are set out in the corresponding EIAR Chapters. Some general assumptions that have been made during preparation of this EIAR are set out below:

- In undertaking cumulative assessments, consented, but as yet un-built, developments have been assumed to have been built in accordance with and within the duration permitted by the associated grant of permission; and
- Information provided by third parties, including publicly available information and databases, is correct at the time of publication.

Specific limitations relevant to certain environmental aspects are set out in the corresponding EIAR Chapter. Some general limitations associated with the preparation of this EIAR are set out below:

- Baseline conditions and assessments are assumed to be accurate at the time of the physical surveys but may be subject to change, due to the nature of the surrounding environment and surrounding activities; and
- The assessment of cumulative effects from built or consented developments is partially reliant on the availability of information provided by relevant third parties. Local Authority and An Bord Pleanála public planning registers were reviewed as part of the assessment process. None of the individual specialists have highlighted any limitations that are considered significant in terms of the undertaking of these specialist cumulative assessments.

2.7 PROJECT TEAM AND CONTRIBUTORS TO THE EIAR

TOBIN Consulting Engineers were engaged by Greener Ideas Limited to coordinate and prepare this EIAR. The relevant inputs of the various contributors and competent experts of the Project Team are provided in Table 2-3 and Table 2-4.

It should be noted that the Project Manager and principal coordinator of this EIA Report was Louise Byrne, Senior Planner in TOBIN Consulting Engineers. Louise has over 8 years' experience in development management for local government, semi state and consultancy. Louise has a Masters in Regional and Urban Planning from University College Dublin and is a chartered member of the Royal Town Planning Institute.

Table 2-3: List of Company Contributors to the EIAR

Company	Name	Contribution to the EIAR
TOBIN Consulting Engineers	(EIAR Chapter number for which primary author) Damien Grehan Siobhán Tinnelly Louise Byrne (1, 3, 4,5, 6, 16, 17, 18) Caroline Naughton (2) Michael Nolan John Dillon (8, 9) Serena Byrne (7) Áine Sands (12) Laura Kennedy (12) Gabriela Iha (15) Maria Rooney (15)	Project Direction and Management, Scoping and Consultation, Co-Ordination, Preparation of Figures, and the following Chapters: Introduction EIA Report Methodology Description of Development Need for the Development Consideration of Alternatives Planning Policy Population and Human Health Land, Soils and Geology Hydrology and Hydrogeology Biodiversity Traffic and Transportation Material Assets

		Major Accidents and Disasters Interactions of the Foregoing TOBIN has also prepared the planning application and planning drawings
AWN Consulting	Damian Kelly Dermot Blunnie	Noise and Vibration
AWN Consulting	Jovanna Ardath	Air Quality
Macroworks	Richard Barker Karen O'Neill	Landscape and Visual Impact
IAC Archaeology	Faith Bailey	Cultural Heritage
O'Dwyer & Jones - Aviation Planning	Declan O'Dwyer	Technical Input on Aviation

Table 2-4: List of Competent Experts Contributing to the EIAR

Company/Individual	Competent Experts	Qualifications	No. of Years' Experience
TOBIN Consulting Engineers	Damien Grehan	Honours Degree in Engineering (1992), University College Dublin (UCD) Masters' Degree in Engineering Science (1994), UCD Chartered Engineer	25
TOBIN Consulting Engineers	Siobhán Tinnelly	Diploma in Corporate Governance, Corporate Governance Institute, 2022 Postgraduate Diploma in Management, Irish Management Institute (IMI), 2017 MSc. Applied Hydrogeology, University of Newcastle-upon-Tyne, 2013 Post Graduate Diploma in Environmental Engineering, Trinity College Dublin, 2004 B.A. (Mod) Natural Sciences (Env. Science), Trinity College Dublin, 1996-2000 Professional Geologist, P.Geo. Institute of Geologists of Ireland (IGI)	20
TOBIN Consulting Engineers	Louise Byrne	PG Certificate GIS (2016) University of Leeds, UK Masters in Regional & Urban Planning (MRUP) (2006). University College Dublin (UCD) BA Hons International Geography & German (2004) UCD Chartered Member of Royal Town Planning Institute (2010)	8

TOBIN Consulting Engineers	Caroline Naughton	BSc., Environmental Science/Geology (2005) University College Cork (UCC) Postgraduate Diploma, NFQ Level 9, Quality Management – Lean Systems, (2018) University of Limerick (UL)	15
TOBIN Consulting Engineers	John Dillon	BSc. in Environmental Science (2001), NUIG MSc. and Diploma in Environmental Engineering (2003), Imperial College London Professional Geologist (PGeo)	16
TOBIN Consulting Engineers	Michael Nolan	City & Guilds in Computer Aided Design (2001), Griffith College Dublin	16
TOBIN Consulting Engineers	Áine Sands	University College Cork - Ireland, BSc (Hons) – Applied Ecology (2013)	5
TOBIN Consulting Engineers	Laura Kennedy	M.Sc., Environmental Science, Trinity College, Dublin (2008 – 2009) B.Sc., Zoology, University College, Cork (2003 – 2007)	12
TOBIN Consulting Engineers	Gabriela Iha	B.E. Civil Engineering, Centro Universitario da FEI, Brazil (2017) MSc Sustainable Transport and Mobility, TU Dublin (2022)	5
TOBIN Consulting Engineers	Maria Rooney	MEng Road and Transport Engineering, IT Sligo, 2019 BEng (Hons) Civil Engineering, IT Carlow, 2013 BEng (Ord) Civil Engineering, DKIT, 2010 CEng Engineers Ireland 2021 MIEI Member of Engineers Ireland (2011)	7
TOBIN Consulting Engineers	John O Flaherty	MEng Roads & Transport Engineering, Institute of Technology Sligo, 2019 BEng Civil Engineering, Queens University Belfast, 1994 Nat. Dip in Water Engineering, Institute of Technology Sligo, 1993 Certificate Roads Safety Audit, University College Dublin, 2013 CEng Engineers Ireland	25
AWN Consulting	Damian Kelly	BSc (Hons) Analytical Science, Dublin City University Environmental Science Queens University Belfast	23
AWN Consulting	Jovanna Arndt	Associate Member of the Institute of Environmental Science (AMIEnvSc) Associate Member of the Institute of Air Quality Management (MIAQM)	

AWN Consulting	Edward Porter	Chartered Chemist Since 2001 (C Chem) Member of the Royal Society of Chemistry Since 1998 (MRSC) Member of the Institute of Environmental Science (MIEnvSc) Member of the Institute of Air Quality Management (MIAQM)	25
Macroworks	Jamie Ball	BA Hons (Landscape Architecture) 1998	12
Macroworks	Richard Barker	PG Diploma in Forestry (1996) BA in Environmental Studies (1995) Master's Degree in Landscape Architecture (2003) Corporate Member of the Irish Landscape Institute	21
IAC	Faith Bailey	2003 MA (Cultural Landscape Management) -University of Wales –Lampeter 2001 BA (Hons) Archaeology – University of Wales – Lampeter Member of the Chartered Institute for Archaeologists & Member of the Institute of Archaeologists of Ireland	18
O'Dwyer & Jones - Aviation Planning	Declan O'Dwyer	J.D. O'Dwyer has been a chartered member of the Royal Institute of British Architects for thirty years, and is a principal airports planner of the Irish Airports Authority, with responsibility for the master planning of Irish civil airports and Irish military aerodromes, and for the planning evaluation of buildings and structures at (and in the vicinity of) the Irish state airports (both civil and military); he has also been responsible for the planning and design of a large variety of airport buildings and structures at civil and military airports.	30

3.0 DESCRIPTION OF DEVELOPMENT

3.1 OPERATIONAL OVERVIEW

The proposed 110kV electrical substation (hereafter referred to as the "Baldonnell Substation") and associated grid connection are being developed to provide a connection from the adjacent peaking power plant to the existing electricity transmission system.

Electrical power will be exported from the power plant's main transformers through the proposed Baldonnell Substation to the existing Barnakyle 110kV substation, which is operated by EirGrid and owned by ESB. The associated grid connection works will consist of underground cabling.

The gas fired peaking power plant will operate when electricity demand is higher than average, typically during morning and evening peak usage times. The need for peaking plants on the Irish electricity grid has grown, as renewable forms of power generation increase their penetration onto the system. The variability of renewable generators increases EirGrid's challenge to operate an efficient, safe, and secure electricity system. The modular design of the Profile Park peaker plant, and its fast response capability, means it can react quickly to vary its output, mirroring the peaks and troughs of electricity generation, from renewable generators.

The development of the peaker plant with its associated substation and grid connection, are in line with policies set out in the National Development Plan and the Climate Action Plan 2021.The development is also consistent with Ireland's strategy to achieve its binding 2030 emission targets.

The proposed development will comprise of:

- EirGrid/ ESBN Control Room building
- Associated Internal 15kV and 110kV Underground Cabling
- Installation of a 15/110kV Transformer (TRAFO) with associated equipment including:
    - Cable Sealing End
    - Surge Arrestor
    - Earth Disconnect
    - Current /Voltage Transformer
    - Circuit Breaker
- 110kV underground cable to Barnakyle 110kV substation 3 No Power Ducts and 2 No Telecoms Ducts.
- Diesel Generator
- Security Fencing, Security Cameras and Poles
- Lights/Lamp Poles
- Lightning Masts
- Temporary Construction Compound
- And all other associated site development plant and equipment and other works including surface water and foul wastewater drainage, within an overall redline boundary measuring approximately 2.6 hectares.

3.2 DESCRIPTION OF PROPOSED DEVELOPMENT

3.2.1 Substation

The proposed Baldonnell 110kV substation site measures approximately 87.75m long, 22.25m wide and will be bounded by a 2.6m high palisade fence.

The compound will house a 126m² EirGrid 110kV substation control building which will measure 14m long x 9m wide x 6.7m high and will be finished externally with scud render & float in sand, white cement plaster, nap finish. The roof of the building will consist of standard Selected Blue/Black slate finish.

Associated outdoor electrical equipment will include:

- 1 no. 110kV transformer.
- 110kV Switchgear.
- an associated internal 15kV underground cable.
- an internal access track.
- a diesel generator.
- Lightning masts* measuring 18m in height.
- Approximately 15 Light Poles** measuring 3.5m in height.
- 2 no. security cameras and poles will be installed.

The site has been designed to meet EirGrid's specifications.

Access to the substation compound will be provided via the adjacent gas fired power plant site, with 2 no. 4.9m wide access gates proposed along the eastern boundary of the proposed substation site.

*Lightning Mast Design will be subject to a lightning survey and confirmed during the detailed design stage of the project.

** Lamp Poles will be the subject of a light survey and the exact number to be provided will be confirmed during the detailed design stage of the project.

It should be noted that within this planning application to An Bord Pleanála the location of the proposed IPP compound is overlapping with an IPP compound already approved under the adjacent Gas Fired Peaking Power Plant application Reg. Ref. SD21A/0167. However the infrastructure proposed as part of this planning application differs slightly. It is intended to build the IPP compound as set out under this planning application with any changes or amendments to application SD21A/0167 to be captured under a separate future consents process.

3.2.2 Grid Connection

The proposed grid connection will consist of underground cabling (UGC).

The underground cable route exits the proposed Baldonnell 110kV Substation from the northside fence and heads in a westerly direction. The route follows the private road (Falcon Avenue) west for approximately 250m until it reaches the entrance to Barnakyle 110kV Substation. The cable then turns south to enter the Barnakyle substation through existing ducts.

This section of the route is almost entirely within the road except for the crossover into the substation.

A site layout of the proposed Baldonnell 110kV substation and associated grid connection is provided under Figure 3-1.

The UGC works will consist of the installation of 6 No. ducts in an excavated trench to accommodate 3 No. power cables, 2 No. fibre communications cable to allow communications between the Baldonnell and ESB Barnakyle 110kV Substation and one earth continuity conductor (ECC).

3.2.3 Temporary Construction Compound

A temporary construction compound will be provided approximately 185m southeast of the proposed development site, the location of which is indicated in Figure 3-2.

The compound will comprise of areas for temporary site offices (portacabins), staff welfare facilities, car parking, material and equipment storage and material laydown areas. Potable water, foul water and electrical connections will be provided to accommodate the above.

The site will be fully reinstated upon completion of all works.

3.3 GAS FIRED PEAKING POWER PLANT

For the purpose of cumulative assessment, this section of the report provides a description of the adjacent gas fired peaking power plant infrastructure. The power plant will comprise the following main components:

- Site Entrance.
- Engine Hall comprising up 5 no. gas engines and 2 no. exhaust stack clusters.
- Electrical Annex Building.
- Workshop Building.
- Security Hut.
- Radiator Coolers.
- Gas Above Ground Installation (AGI).
- Tank Farm comprising; 2 No. Diesel Oil Storage Tanks, 2 No. Lube Oil Storage Tank. 1 No. Urea Storage Tank
- Fencing;
- Car Parking; and
- Landscape planting around perimeter of site.

A site layout of the gas fired power plant is provided under Figure 3-3.

3.4 CONSTRUCTION PHASE ACTIVITIES

3.4.1 Construction Phase Description and Duration

It is expected that construction will commence in 2023 with design, construction, and commissioning activities lasting for approximately 12 months. The proposed Baldonnell 100kV substation is expected to become fully operational, along with the gas fired power plant , which

is currently expected to be operational in 2024, subject to timely receipt of the necessary statutory consents.

The total number of construction staff on-site will vary during the construction phase of the works but are expected to peak at approximately 20 persons per day.

Standard working hours for construction will be 7.00am to 7.00pm Monday to Friday and 8.00am to 9.00pm on Saturday (if required), with no works on Sundays or Bank Holidays except in exceptional circumstances or in the event of an emergency. All site personnel will be required to wear project notification labelling on high visibility vests and head protection so that they can be easily identified by all workers on-site.

Please refer to Appendix 3-1 of this report, for a full description of the construction methodology for the proposed development.

3.4.2 Construction Environmental Management Plan

The primary objective of the Construction Environmental Management Plan (CEMP) is to safeguard the environment, site personnel, and nearby sensitive receptors, i.e., occupiers of residential and commercial properties, from site activity which may cause harm or nuisance. It is therefore intended to provide a framework to ensure transparent and effective monitoring, prevention, management, and compensation measures to address the environmental impacts associated with the proposed substation.

During construction, an EPC Contractor(s) will be appointed with responsibility for constructing the proposed substation. Performance of the EPC Contractor(s) will be monitored on a regular basis. The following activities will be undertaken throughout the duration of the construction period:

- Review contractor documents against the requirements of the CEMP;
- Undertake regular audits;
- Continuously check records;
- Set up a contractor reporting structure; and
- Conduct regular meetings where the Environment, Health & Safety (EHS) matters will be an agenda item.

It will be the responsibility of the EPC contractor(s) to implement the construction phase management and monitoring measures outlined in the CEMP. The EPC Contractor(s) will be required to undertake regular monitoring and inspections, keep up to date records as prescribed in the CEMP, and report regularly to Greener Ideas Limited project management team.

During operation, Greener Ideas Limited will have responsibility for the operation of the adjacent gas fired power plant and part of the proposed Baldonnell 110kV substation, with the other half of the substation site owned and operated by ESB and EirGrid.

A copy of the CEMP is provided in Appendix 3-2.

3.4.3 Construction and Demolition Waste Management Plan

A Construction and Demolition Waste Management Plan (CDWMP) has been prepared in accordance with the Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects , published by the EPA in November

2021. These guidelines replace the 2006 guidelines previously published by the former Department of the Environmental, Heritage and Local Government (DOEHLG) and the National Construction and Demolition Waste Council (NCDWC).

The main objective of these guidelines is to provide a practical and informed approach informed by best practice in the prevention and management of C&D wastes and resources from design to construction of a project (including consideration of deconstruction). The guidelines provide those involved in a project, including clients, developers, designers, practitioners, contractors, sub-contractors and competent authorities, with a common approach when preparing Resource and Waste Management Plans (RWMPs) for C&D projects.

The requirement to develop, maintain and operate this CDWMP to a detailed Construction & Demolition Waste Management Plan (CDWMP) will form part of the contract documents for the project.

On commencement of the project, the EPC Contractor appointed to undertake the works will be responsible for the development of this CDWMP and the implementation of all necessary protocols and measures to ensure regulatory compliance, including the provision of data to Greener Ideas Limited to enable fulfilment of reporting obligations.

The CDWMP is included in Appendix 3-3 of this EIAR.

3.4.4 Pre-Construction

The pre-construction phase of development includes preparatory works (i.e., post planning surveys and reporting) and consultation with statutory bodies and the public.

It will be required to carry out site investigations along the cable route, prior to construction, to confirm design assumptions. The following investigation methods may be carried along the grid connection cable route:

- Slit trenches at locations of service crossings (Full road width).
- Trial holes along the route to ascertain ground conditions and thermal resistivity of the soil.

Following this process, site clearance activities will commence. Typical activities will include preparation of the construction working area and topsoil stripping. Prior to the commencement of construction activities, the area for development will be fenced off, and the site will be levelled to 74.6 AOD. Soil management proposals will be developed and will indicate:

- The intended soil stripping depth;
- Options for separating and keeping different soils apart;
- Methods for handling soil;
- The location and height of soil storage mounds and how long they will be present; and
- Proposals for reinstating or disposing of soils.

Site mobilisation will see the establishment of temporary facilities to accommodate competent construction staff, their plant, equipment, and materials. During mobilisation the site staff will establish safe systems of work, to ensure construction can proceed without endangering the environment, the public or themselves. Training in health and safety will be provided for all staff during the mobilisation period, and all staff will be required to hold SAFEPASS or equivalent certification.

3.4.5 Civil and Construction Works

Concrete pouring and filling will be fully controlled to ensure that cement bound materials do not present any pollution risk. All concrete pouring and filing will be supervised and monitored.

Trucks, mixers, and concrete pumps that have contained concrete will be washed out in a designated impermeable area to prevent pollution. Where possible, washout water will be stored and re-used.

A Construction Traffic Management Plan (CTMP) will be prepared in advance of the construction phase of development in order to ensure safe movements and interactions between vehicles and pedestrians, both on and adjacent to the site. The CTMP will cover all expected work activities, delivery and storage areas, and shall be expanded and / or amended to cover new or altered activities as they arise. The main components of the CTMP will be:

- Description and scope;
- Staging of the works;
- Traffic control during construction;
- Trucks movements to the site;
- Road signs for full and partial road closure;
- Parking for workers and subcontractors;
- Pedestrian safety;
- Site traffic management supervisor; and
- Abnormal load (i.e., for substation transformer) and associated permit applications applied for and secured from/by South Dublin County Council in advance of abnormal load delivery to site.

The CTMP will also provide for the requirement that entrances and roads are kept clean and clear of obstructions to prevent the spillage or deposit of clay, rubble, or other debris on the entrance and other roads throughout the contract period.

3.5 OPERATIONAL PHASE ACTIVITIES

3.5.1 Hours of Operation

The proposed Baldonnell 110kV substation will operate in parallel with the adjacent gas fired power plant. Its actual operating hours will be determined by EirGrid, who are the Transmission System Operator (TSO). They will issue dispatch instructions to the plant from the National Control Centre using an Electronic Dispatch Instruction Logger system (EDIL).

The environmental modelling undertaken as part of this EIA Report has predicted no significant environmental effects based on a worst-case operating scenario (i.e., operating 24 hours a day, 365 days per year unless otherwise stated).

3.5.2 Operational Staff

The proposed Baldonnell 110kV substation will be unmanned.

3.5.3 Utilities and Services

Surface Water Drainage

It is proposed to discharge surface water generated on the site into a Soakaway located beneath the proposed ca parking area. Due to the poor infiltration rate of the site, it is proposed to provide an overflow pipe within the soakaway to discharge surface water into the new infrastructure on the neighbouring power plant site. Surface water discharge rate will be maintained by a flow control device, limiting discharge rate from the site to 2l/s.

The surface water drainage network has been designed and simulated for a range of storm events (including 1 in 5, 1 in 30 and 1 in 100-year storm events) using the Source Control module of MicroDrainage. Refer to Appendix A for simulation results.

As part of the surface water drainage design strategy, the following items have been included in order to effectively manage surface water at the site:

- Petrol Interceptor – Full retention petrol interceptors have been included in the surface water collection system on a precautionary basis. The full retention petrol interceptors will be fitted with visual and audible alarms to ensure containment facilities are adequately maintained. In addition, this alarm will be linked to telemetry facilities such that relevant staff will be alerted if oil is detected at trigger levels;
- Hydrobrake - The rate of discharge from the proposed development will be controlled using a Hydrobrake. The total rate of discharged was determined using the QBAR greenfield run off method. The total rate of discharge was calculated at 2.00l/s;
- Soakaway - It is proposed to install a soakaway beneath the parking area. The water, once discharged to the soakaway, will be allowed to infiltrate into the groundwater. Groundwater in the area was recorded at approximately 71.8mOD from the standpipe results. When the rate of water being collected by the underground pipes exceeds the infiltration rate into the ground, the collected water will be directed to an overflow pipe. The overflow pipe will discharge the excess water into the surface water infrastructure in the neighbouring Power Plant Site;
- Down Pipes/Gullies – It is proposed that surface water will be collected from roofed buildings via standard rainwater down pipes while runoff from un-roofed structures will drain to the access roads where it will enter the drainage network via road gullies. It is also proposed that gullies and drain entry points will incorporate silt traps to remove any grit or silt which may be washed into the drainage system.
- Flow Control Device – It is proposed to limit the surface water runoff from the site to be similar to the Greenfield runoff as per the requirements of the Great Dublin Strategic Drainage Study. It is proposed to install a Hydrobrake downstream of an attenuation tank to limit the flow from the site to 4.1l/s, which will be located on the adjacent power plant site.

Surface water drainage calculations informing the drainage design are provided in Appendix 3-4.

Foul Wastewater Drainage

Although the proposed substation will be unmanned, any wastewater generated at the proposed development site will arise from a welfare facility, consisting of a sink and toilet for operatives use when on site.

It is proposed to discharge wastewater generated on the site into the permitted new infrastructure on the neighbouring Power Plant site, reducing the number of connections required into the existing network within the Profile Park Campus Falcon Avenue access road. The wastewater layout has been designed in accordance with Irish Water's latest standard details and code of practice.

In relation to the associated Gas Fired Peaking Plant, Irish Water has confirmed via its 'Pre-connections Enquiry' process that water wastewater can be facilitated through the existing network (IW reference: CDS21002228). A copy of Irish Waters confirmation is included in Appendix 3-5.

Lighting

Approximately 15 no. Lights are proposed as part of the proposed development.

3.6 HEALTH AND SAFETY CONSIDERATIONS

3.6.1 Project Supervisor Construction Stage

A Project Supervisor Construction Stage (PSCS) will be appointed by Greener Ideas Limited for the construction phase of the substation. The PSCS will be responsible for managing and co-ordinating the safety and health issues on site.

The PSCS will develop a suitable Safety and Health Plan for the project prior to the commencement of construction. The plan will explain how the key safety and health issues will be managed. The other responsibilities of the PSCS include the following:

- Co-ordinate the implementation of the construction regulations by contractors;
- Organise co-operation between contractors and the provision of information;
- Co-ordinate the reporting of accidents to the Health and Safety Authority;
- Notify the Health and Safety Authority before construction commences;
- Provide information to the site safety representative;
- Co-ordinate the checking of safe working procedures;
- Co-ordinate measures to restrict entry on to the site;
- Co-ordinate the provision and maintenance of welfare facilities;
- Co-ordinate arrangements to ensure that general construction workers and security workers have a Safety Awareness card, e.g., Safe Pass and a Construction Skills card where required;
- Co-ordinate the appointment of a site safety representative where there are more than 20 persons on site;
- Appoint a safety adviser where there are more than 100 on site;
- Monitor the compliance of contractors and others and take corrective action where necessary; and

- Notify the Authority and the client of non-compliance with any written directions issued.

It is important to note that the presence of a PSCS does not release other contractors/employers of their obligation to comply with their statutory safety and health obligations.

3.6.2 Seveso

No substances will be stored on the proposed Baldonnell 110kV substation site and as such the project is not subject to any of the requirements contained in the Chemical Act (Control of Major Accident Hazards involving Dangerous Substances) Regulations 2015.

3.6.3 Chemical Storage

Batteries will be on site within the EirGrid compound building as part of normal operation. The transformer will be oil filled but there is no requirement for additional oil to be stored on site. The diesel generator will require diesel onsite for power outage situations only. It is not expected to have diesel stored on site. Otherwise, no chemicals will be stored on site.

3.6.4 Firefighting Systems and Controls

A dedicated private fire ring main and hydrants, will be installed as part of the adjacent power station, that will serve the proposed substation. They will comply with IS 391:2020 Fire mains for buildings - Installation, commissioning, maintenance, and testing. A minimum of seven hydrants are being provided on the site, three of which are within close proximity of the proposed substation and on a route accessible by fire appliances. The hydrants will comply with the requirements of BS 750:2012 Specification for underground fire hydrants and surface box frames and covers. All hydrants will be conspicuously marked in accordance with BS 3251:1976 Specification of indicator plates for fire hydrants and emergency water supplies. The hydrants will be located such that they are not less than 6m or more than 46m from a building, and the distance from a hydrant to a vehicle access roadway or hard standing for fire appliances is not more than 30m.

A water storage tank will be provided on the power station site to ensure the security of the water supply for operational and firefighting needs. The tank shall serve both the ring main and hydrants. The latest calculations as provided to Irish Water, indicate that the water tank shall have a dedicated firefighting water storage capacity of circa 545m3, which will provide water at a rate of 75L/minute for 90 minutes.

3.7 DECOMMISSIONING

The proposed Baldonnell 110kV substation is expected to be operational in accordance with the adjacent gas fired power plant. The power plant is expected to be operational for at least 25 years. On cessation of activities, the plant will either be redeveloped as a power related facility or the site will be redeveloped in an alternative form.

In the event that the substation is decommissioned, the following programme will be implemented:

- All plant equipment and machinery will be emptied, dismantled, and stored under appropriate conditions until it can be sold. If a buyer cannot be found, the material will be recycled or disposed of through licensed waste contractors and hauliers. If plant and

machinery is required to be cleaned on site prior to removal, all necessary measures will be implemented to prevent the release of contaminants.

- All waste will be removed from the facility; and
- The site and all associated buildings will be secured.
- Waste will be recycled wherever possible. All waste movement, recycling, and disposal operations will be controlled by licensed waste contractors.

Details of provisions to decommission and render safe or remove all materials, waste, ground, plant, or equipment contained on or in the site that may result in environmental pollution will be agreed with the Environmental Protection Agency as part of the Industrial Emissions Licensing process.

ISO A1 594mm x 841mm

Map Series:
Prime2 Vector Data - 1:2500

Map Sheets:
3325-B, 3326-A, 3325-D & 3326-C

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Surface Water Sewer Undercrossing Ref. Drg. 05868-DR-009

Foul Sewer Undercrossing Ref. Drg. 05868-DR-011

Watermain (WM11) Undercrossing Ref. Drg. 05868-DR-011

Gas Network Service Undercrossing Ref. Drg. 05868-DR-009

ESB Service Crossing

Location of Site Notice Nr 03

Location of Site Notice Nr 02

Existing ESB Barnakyle 110kV Substation

Baldonnell 110kV Substation

As-built position of existing Castlebagot / Inchicore 220kV UGC Joint Bay.

"Approved gas fired Power Plant application reference SD21A/0167 - currently under construction"

* Please Note - Overall site dimensions & contours are shown on this drawing. For distances of structures to nearest site boundaries & spot levels please refer to drawing nr 05868-DR-031.

21.69m
15.22m
16.92m
16.37m
14.92m
13.26m
17.88m
17.72m
11.86m
13.59m
74.0m
87.38m
10.97m
10.74m
25.21m
6.62m
74.26m
6.68m
22.25m
6m
16m
FFL: 74.80 AOD
EGL: 73.75 AOD
EGL: 74.00 AOD
73.75m
Tk

REF TO 05868-DR-013

MATCHLINE

PROFILE PARK

SITE LAYOUT PLAN
Scale : 1:500

1:500
10m 0 10m 20m 30m 40m 50m

Project Management Initials: Designer: GD Checked: KC Approved: GH

tli GROUP

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PROJECT

110kV Baldonnell Substation

CLIENT

Greener Ideas

CONSULTANTS

NOTES: -

- All proposed routes shown are indicative only at this stage and are subject to further assessment.
- Additional watercourses and services may be encountered.
- The property boundaries shown (while an accurate representation) are for information purposes only. Precise digital boundaries will be obtained from PRAI & mapped in advance of any formal Section 53 Wayleave or Deed A / Deed B being served on the landowner.

LEGEND: -

- Proposed 110kV Grid Connection UGC (0.268km)
- Planning Boundary shown thus
- "Approved gas fired Power Plant application reference SD21A/0167 - currently under construction" shown thus
- Barnakyle 110kV Substation shown thus
- Existing ESB Underground UG Cable shown thus
- Existing ESB Castlebagot - Inchicore 220kV Underground UG Cable shown thus
- Existing Irish Water Network shown thus
- Existing Surface Water Network shown thus
- Existing GNI Gas Network shown thus
- Existing Contour Lines shown thus

ISSUE/REVISION

I/R	DATE	DESCRIPTION
P6	31.05.23	Issued for Planning
P5	23.05.23	Issued for Planning
P4	19.05.23	Issued for Planning
P3	11.05.23	Issued for Planning
P2	15.03.23	Issued for Planning
P1	24.02.23	Issued for Planning

PROJECT NUMBER

05-868

SHEET TITLE

Figure 3-1
Site Layout Plan -
UGC Grid Route

SHEET NUMBER

05868-DR-004

Legend

- Planning Application Boundary
- Proposed Temporary Construction Compound

0 25 50 75 100
Meters

NOTES

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

Rev	Date	Description	By	Chkd
A	25/05/2023	Final issue	S.P	C.N

Client: Greener Ideas

Project:
Profile Park power plant - Substation Application

Title:
Figure 3-2:
Proposed Temporary Construction Compound

Scale @ A3: 1:2,500

Prepared by:	Checked by:	Date:
S.Pezzetta	C.Naughton	May 2023

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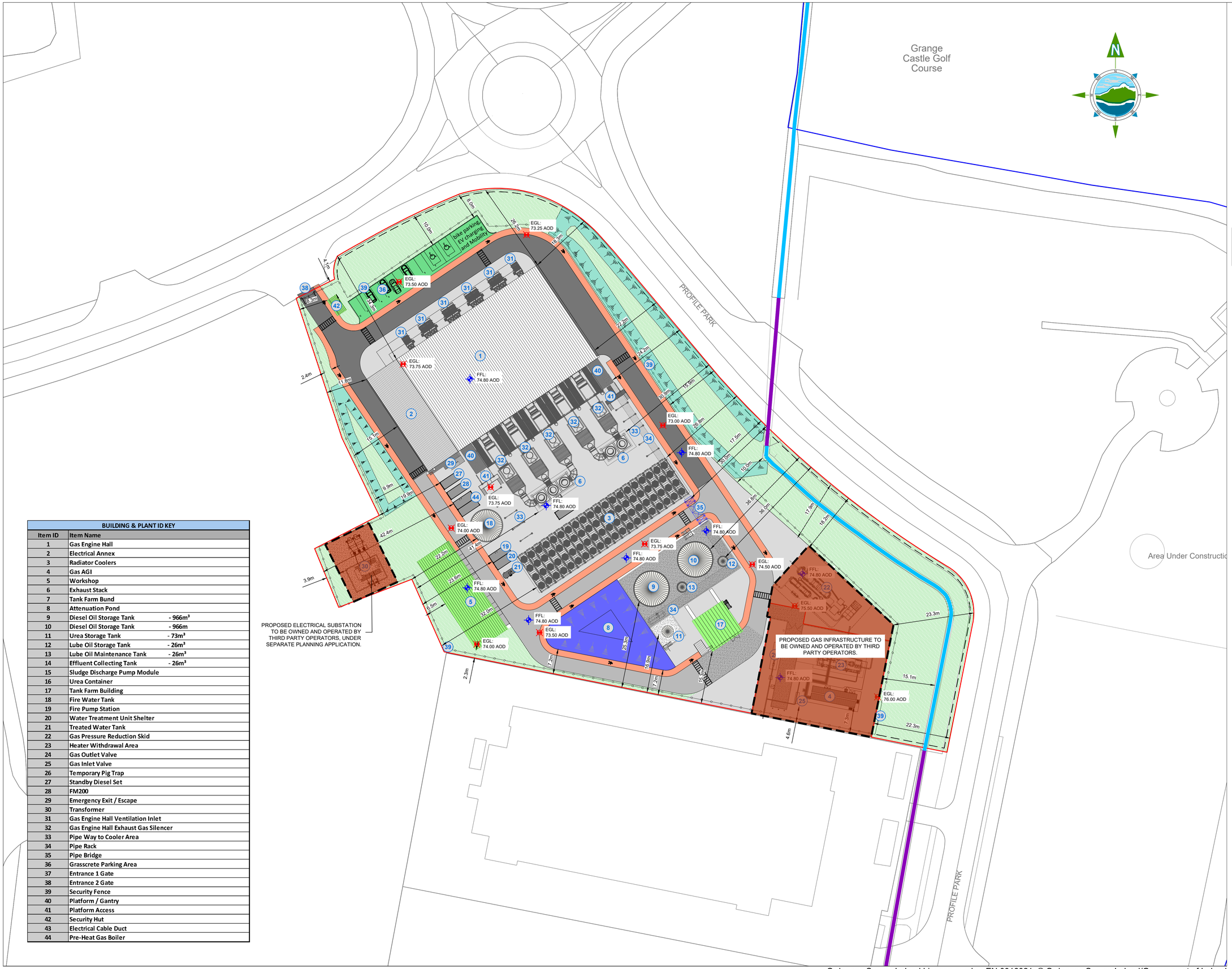
Map Ref: 11069-010-C.C-AE-TOB-A

Draft: A



BUILDING & PLANT ID KEY	
Item ID	Item Name
1	Gas Engine Hall
2	Electrical Annex
3	Radiator Coolers
4	Gas AGI
5	Workshop
6	Exhaust Stack
7	Tank Farm Bund
8	Attenuation Pond
9	Diesel Oil Storage Tank - 966m³
10	Diesel Oil Storage Tank - 966m
11	Urea Storage Tank - 73m³
12	Lube Oil Storage Tank - 26m³
13	Lube Oil Maintenance Tank - 26m³
14	Effluent Collecting Tank - 26m³
15	Sludge Discharge Pump Module
16	Urea Container
17	Tank Farm Building
18	Fire Water Tank
19	Fire Pump Station
20	Water Treatment Unit Shelter
21	Treated Water Tank
22	Gas Pressure Reduction Skid
23	Heater Withdrawal Area
24	Gas Outlet Valve
25	Gas Inlet Valve
26	Temporary Pig Trap
27	Standby Diesel Set
28	FM200
29	Emergency Exit / Escape
30	Transformer
31	Gas Engine Hall Ventilation Inlet
32	Gas Engine Hall Exhaust Gas Silencer
33	Pipe Way to Cooler Area
34	Pipe Rack
35	Pipe Bridge
36	Grasscrete Parking Area
37	Entrance 1 Gate
38	Entrance 2 Gate
39	Security Fence
40	Platform / Gantry
41	Platform Access
42	Security Hut
43	Electrical Cable Duct
44	Pre-Heat Gas Boiler

GENERAL LEGEND

- PLANNING APPLICATION BOUNDARY
- TARMAC SURFACED ACCESS ROADS
- GRAVEL SURFACED ACCESS ROADS
- CRUSHED ROCK HARDSTAND AREA
- CONCRETE HARDSTAND AREA
- GRASSCRETE PARKING AREA
- AREA RESERVED FOR LANDSCAPING
- ATTENUATION POND
- GREEN ROOF ON BUILDINGS
- PEDESTRIAN FOOTPATH
- BUILDING ID TAG (39)
- OPEN LAND DRAIN
- EXISTING BALDONNEL STREAM CULVERT
- 2.4m HIGH PALADIN SECURITY FENCE
- EXTERNAL BOUNDARY TREATMENT
- EXISTING GROUND LVL. EGL: ##.## AOD
- FINISHED FLOOR LVL. FFL: ##.## AOD

As agreed with South Dublin County Council in the pre-application consultation meeting the final finishes, including cladding materials and colour codes, will be agreed with the Council post planning through planning condition. Greener Ideas Limited will ensure only Council approved finished are applied on site.

NOTES:

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING.
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
3. ENGINEER/EMPLOYERS REPRESENTATIVE, AS APPROPRIATE, TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
4. THE CONTRACTOR SHALL UNDERTAKE A THOROUGH CHECK FOR THE ACTUAL LOCATION OF ALL SERVICES/UTILITIES, ABOVE AND BELOW GROUND, BEFORE ANY WORK COMMENCES
5. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

CO. DUBLIN

OSI 1:2,500 Sheet No's: 3325-B, 3325-D, 3326-A & 3326-C.

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10m 0 10m 20m 30m

Rev	Date	Description	By	Chkd.
C	01.07.22	LICENCE ISSUE	MN	RH
B	23.05.22	CFI ISSUE	MN	LB
A	01.03.22	PLANNING ISSUE	MN	MMcC

Client: Greener Ideas

Project: Baldonnell 110kV substation

Title: FIGURE 3-3 APPROVED GAS FIRED POWER PLANT SITE LAYOUT PLAN

Scale @ A1: 1:500

Prepared by:	Checked:	Date:
M. Nolan	M. McCarthy	March 2022

Project Director: S. Tinnelly

Drawing Status: Planning

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4.0 NEED FOR THE OVERALL DEVELOPMENT

4.1 INTRODUCTION

This chapter of the EIAR sets out the strategic policy context at a European and national level, for the proposed substation and its associated gas fired power plant, both of which are required to assist in reducing the use of fossil fuels in the generation of electricity in Ireland.

The key driver in the requirement for low-carbon generation technology is set out in binding European targets to reduce greenhouse gas emissions. The current and future demands of electricity generation are detailed and highlight the importance of gas power plants during Ireland's transition to a low-carbon future, as well as their potential to support expanding offshore wind generation in the Dublin region.

4.2 EUROPEAN POLICY CONTEXT

4.2.1 European Green Deal

The energy sector is responsible for more than 75% of the EU's greenhouse gas emissions. Increasing the share of renewable energy across the different sectors of the economy is therefore a key building block to achieving an integrated energy system that delivers on Europe's ambition of climate neutrality. The European Green Deal moreover sets out the EU's path to climate neutrality by 2050, through the deep decarbonisation of all sectors of the economy, and higher greenhouse gas emission reductions for 2030. The figure below illustrates the various elements of the Green Deal.

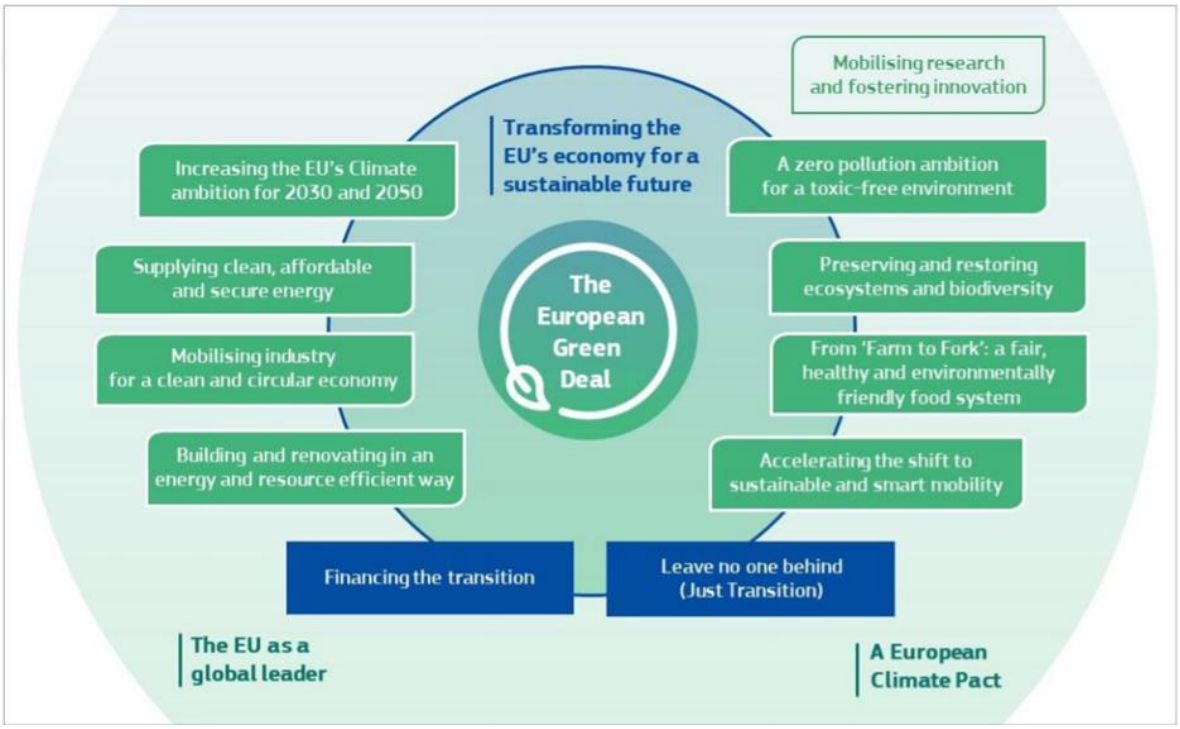


Figure 4-1: European Green Deal

To deliver the European Green Deal, there is a need to rethink policies for clean energy supply across the economy, industry, production and consumption, large-scale infrastructure,

transport, food and agriculture, construction, taxation and social benefits. The climate action initiatives under the Green Deal include:

- European Climate Law to enshrine the 2050 climate-neutrality objective into EU law;
- European Climate Pact to engage citizens and all parts of society in climate action;
- 2030 Climate Target Plan to further reduce net greenhouse gas emissions by at least 55% by 2030;
- New EU Strategy on Climate Adaptation to make Europe a climate-resilient society by 2050, fully adapted to the unavoidable impacts of climate change; and

In July 2021, the European Commission launched the first tranche of its 'Fit for 55%' measures that will support Europe's climate policy framework and put the EU on track for a 55% reduction in carbon emissions by 2030, and net-zero emissions by 2050.

A REPowerEU Plan was published by the European Commission in 2022 with the purpose of saving energy, producing clean energy and diversifying the supply of energy. The plan was produced in response to the Ukraine war, and aimed to reduce Europe's dependence on Russian fossil fuels. The Plan contains strategies and measures to phase out the EU's dependency on Russian fossil fuels by the end of the decade by building on the implementation of the European Green Deal and the EU's "Fit for 55" proposals (seeking to cut emissions by at least 55% by 2030). The Plan focuses on diversifying energy sources, accelerating a transition from fossil fuels to clean energy, saving energy, smart investment and reinforcing preparedness.

4.2.2 A Clean Planet for all: A European strategic long-term vision for a prosperous, modern, competitive and climate neutral economy (2018)

The aim of this long-term strategy is to confirm Europe's commitment to lead in global climate action and to present a vision that can lead to achieving net-zero greenhouse gas emissions by 2050 through a socially fair transition in a cost-efficient manner.

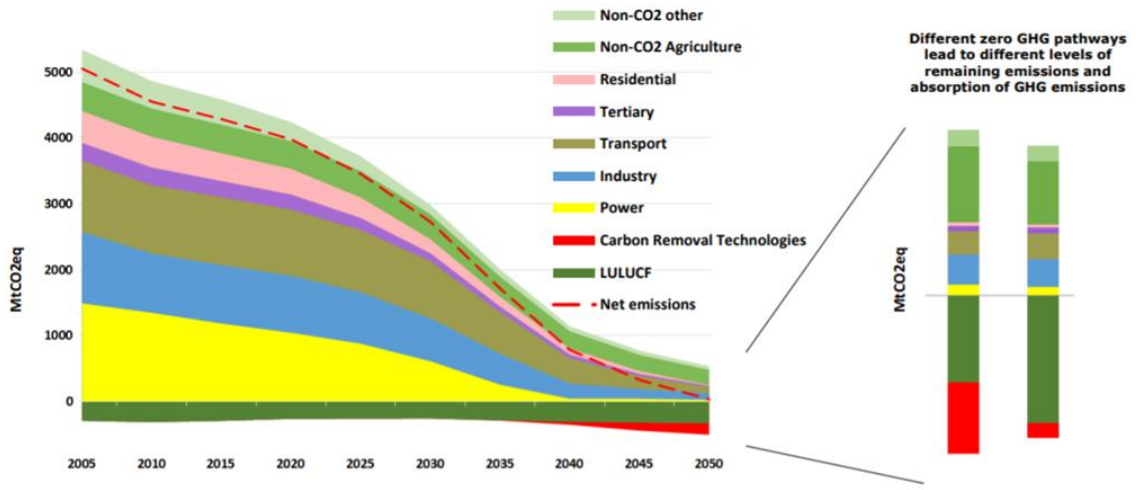


Figure 4-2: GHG emissions trajectory in a 1.5 degrees C scenario

There are several pathways to achieve a climate neutral net-zero greenhouse gas emissions in line with the above aim and include:

- Accelerate the clean energy transition, ramping up renewable energy production, high energy-efficiency and improved security of supply, with increased focus on reducing cyber security threats, while ensuring competitive energy prices, all of which power the modernisation of our economy;

- Recognise and strengthen the central role of citizens and consumers in the energy transition, foster and support consumer choices reducing climate impact and reap collateral societal benefits improving their quality of life;
- Roll out carbon-free, connected and automated road-transport mobility; promote multi-modality and shifts towards low-carbon modes such as rail and waterborne transport; restructure transport charges and taxes to reflect infrastructure and external costs; tackle aviation and shipping emissions using advanced technologies and fuels; invest in modern mobility infrastructure and recognise the role of better urban planning;
- Boost the EU's industrial competitiveness through research and innovation towards a digitalised and circular economy, that limits the rise of new material dependencies. Start testing at scale breakthrough technologies. Monitor the implications on the EU's terms of trade, for the energy intensive industries and suppliers of low carbon solutions. Ensure competitive markets that attract low carbon industries, and that are in line with international obligations. Alleviate competitive pressures that could lead to carbon leakage and unwanted industrial relocation.
- Promote a sustainable bioeconomy, diversify agriculture, animal farming, aquaculture and forestry production. Increase productivity, while also adapting to climate change, preserving and restoring ecosystems, and ensuring sustainable use and management of natural resources.
- Strengthen infrastructure and make it climate proof. Adapt through smart digital and cyber-secure solutions to the future needs of electricity, gas, heating and other grids allowing for sectoral integration starting at local level and with the main industrial/energy clusters;
- Accelerate near-term research, innovation and entrepreneurship in a wide portfolio of zero-carbon solutions, reinforcing the EU's global leadership.

4.2.3 Europe 2030 Climate and Energy Framework

EU leaders agreed in October 2014 on new climate and energy objectives for 2030 following a proposal put forward by the European Commission. The 2030 framework aims to make the EU's economy and energy system more competitive, secure and sustainable.

A centrepiece of the 2030 framework is the binding domestic target to reduce greenhouse gas emissions by 40% below 1990 levels by 2030. This will put the EU on the most cost-effective path towards its agreed objective of an 80-95% reduction by 2050. EU leaders also agreed on raising the share of renewable energy to at least 27%.

As of June 2018, the EU has increased its target of 27% of energy from renewable sources by 2030 to 32% which also includes a clause to allow for a further increase in the target by 2023. This amended target is a clear indication that increased renewable energy and related faciliatory power generation infrastructure will remain at the forefront of both EU and national energy policy.

As part of the European Green Deal, the Commission proposed in September 2020 to raise the 2030 greenhouse gas emission reduction target, including emissions and removals, to at least 55% compared to 1990. It looked at the actions required across all sectors, including increased energy efficiency and renewable energy, and started the process of making detailed legislative proposals by June 2021 to implement and achieve the increased ambition.

This will enable the EU to move towards a climate-neutral economy and implement its commitments under the Paris Agreement by updating its Nationally Determined Contribution.

4.2.4 Renewable Energy Directive 2009/28/EC & 2018/2001/EU

The Directive 2009/28/EC on the promotion of the use of energy from renewable sources, known as the "Renewable Energy Directive", implemented the targets associated with the EU's 2020 climate and energy framework. The main target was:

"*Raising the share of EU energy consumption produced from renewable resources to 20%*"

The Directive set national binding targets for all EU countries with the overall aim of making renewable energy sources account by 2020 for 20% of EU energy and for 10% of energy specifically in the transport sector (both measured in terms of gross final energy consumption, i.e. total energy consumed from all sources, including renewables).

In 2018, the Directive was recast (2018/2001/EU) to move the legal framework to 2030 targets, setting a new binding target of at least 32% with a clause for a possible upwards revision by 2023. The recast Directive includes new provisions for enabling self-consumption of renewable energy, an increased 14 % target for the share of renewable fuels in transport by 2030 and strengthened criteria for ensuring bioenergy sustainability. The revision aims to ensure that renewable energy fully contributes to achieving the higher EU climate ambition for 2030, in line with the 2030 Climate Target Plan. The strategy will help build an integrated energy system, based on renewable energy and fit for climate neutrality, and help reach the objectives of the European Green Deal.

4.3 NATIONAL POLICY CONTEXT

4.3.1 Project Ireland 2040 - Our Plan (National Planning Framework)

Ireland 2040 - National Planning Framework, hereafter referred to as the NPF, published by the Government in February 2018, is a 20-year planning framework designed to guide public and private investment, to create and promote opportunities for Irish citizens, and to protect and enhance Ireland's built and natural environment. The new framework sets out five strategic actions required to achieve this vision:

- Developing a new region-focused strategy for managing growth;
- Linking this to a new 10-year investment plan, the Project Ireland 2040 National Development Plan 2018-2027;
- Using state lands for certain strategic purposes;
- Supporting this with strengthened, more environmentally focused planning at local level; and
- Backing the framework up in law with an Independent Office of the Planning Regulator.

The NPF notes that the population of Ireland is projected to increase by approximately 1 million people by 2040 which will result in a population of roughly 5.7 million. This growth will place further demand on both the built and natural environment as well as the social and economic fabric of the country. In order to strengthen and facilitate more environmentally focused planning at the local level, the NPF states that future planning and development will need to

"tackle Ireland's higher than average carbon-intensity per capita and enable a national transition to a competitive low carbon, climate resilient and environmentally sustainable economy by 2050, through harnessing our country's prodigious renewable energy potential."

The NPF states that Ireland's National Energy Policy is focused on three pillars: Sustainability; Security of Supply; and Competitiveness. In line with these principals, the National Strategic Outcome 8 (Transition to Sustainable Energy), notes that in creating Ireland's future energy

landscape, new energy systems and transmission grids will be necessary to enable a more distributed energy generation which connects established and emerging energy sources, i.e., renewables, to the major sources of demand.

To facilitate this, NPF acknowledges the need to:

'*Reinforce the distribution and transmission network to facilitate planned growth and distribution of a more renewables focused source of energy across the major demand centres*.'

Some of the key National Policy Objectives identified in the NPF which are relevant to the proposed substation and associated gas fired power plant are below:

- National Policy Objective 52: The planning system will be responsive to our national environmental challenges and ensure that development occurs within environmental limits, having regard to the requirements of all relevant environmental legislation and the sustainable management of our natural capital;
- National Policy Objective 54: Reduce our carbon footprint by integrating climate action into the planning system in support of national targets for climate policy mitigation and adaptation objectives, as well as targets for greenhouse gas emission reduction; and
- National Policy Objective 55: Promote renewable energy use and generation at appropriate locations within the built and natural environment to meet national objectives towards achieving a low carbon economy by 2050.

In addition to the above objectives, it should be noted that National Strategic outcome 5 of the NPF relates to the creations of "*A Strong Economy Supported by Enterprise, Innovation and Skills*". This strategic outcome is underpinned by a range of objectives relating to job creation and the fostering of enterprise and innovation, including the promotion of Ireland as a sustainable international destination for ICT infrastructure such as data centres and associated economic activities.

4.3.2 Revised National Development Plan 2021-2030

The revised National Development Plan (NDP) 2021 – 2030, published in 2021 and hereafter referred to as the NDP, sets out the investment priorities at national, regional and local planning levels that will facilitate the implementation of the NPF. In the context of the energy sector, the principle objective of the NDP is to assist in ensuring a 'long-term, sustainable and competitive energy future for Ireland'. Targeted investment within regulated network infrastructure ensures that Ireland's power grid is:

- Maintained to the highest international safety standards;
- Fit for purpose in the medium to longer-term in order to meet projected demand levels; and
- Meets the challenge of integrating world-leading levels of renewable energy.

Similar to the precedent set out in the NPF, the NDP states that investments within grid infrastructure are an important enabler of economic growth, and as such, the energy sector will play critical role to play in meeting priority infrastructural needs at both national and local levels. The proposed substation and associated gas power plant presents the type and nature of investment described within the NPD required to achieve the NPF's strategic outcomes.

4.3.3 Government White Paper – Ireland's Transition to a Low Carbon Energy Future 2015-2030

The Government White Paper entitled *Ireland's Transition to a Low Carbon Energy Future 2015-2030* sets out a framework to guide Ireland's energy policy development. This White Paper is an update of the 2007 White Paper and sets out a framework to guide policy and actions that the Irish Government intends to take in the energy sector up to 2030 and also reaching out to 2050. The framework was developed in the context of the significant role played by European institutions in determining energy policy, markets and regulation. Similarly, it takes account of European and international climate change objectives, in particular the Renewable Energy Directive.

The Energy Vision 2050 established in the White Paper describes a 'radical transformation' of Ireland's energy system which it is hoped will result in Green House Gas emissions from the energy sector reducing by between 80% and 95%, compared to 1990 levels. This means that the diversification of energy supply during the national transition to a renewable energy system will need to shift away from carbon-intensive fuels such as peat and coal in favour of lower carbon fuels like natural gas.

The White Paper notes that:

"*Renewable energy will also play a central role in the transition to low carbon energy. No single renewable energy technology – existing or emerging – will alone enable Ireland to overcome the low carbon challenge. Rather,* ***a diverse range of technologies*** *will be required along the supply chains for electricity, heat and transport*".

"*Onshore wind continues to be the main contributor (18.2% of total generation and 81% of RES-E in 2014). It is a proven technology and Ireland's abundant wind resource means that a wind generator in Ireland generates more electricity than similar installations in other countries. This results in a lower cost of support. Due to the variability of wind conditions, wind generation poses challenges to the operation of electricity grids. In Ireland, these challenges are being addressed by the electricity system operators under their DS3 programme."*

In addition to this and of direct relevance to the proposed substation and associated power plant, the White Paper acknowledges that an uninterrupted supply of energy is vital to the functioning of Irish society and economy. Thus, adequate infrastructure and the diversification of energy supply which avoids overdependency on any particular fuel, supplier, route or region is necessary. Natural gas will therefore remain a significant element of Ireland's energy supply.

4.3.4 Climate Action Plan 2023 (CAP23) Changing Ireland for the Better

CAP23 sets out the government's ongoing and urgent response to the climate crisis. The Plan implements carbon budgets and sectoral emission ceilings, first introduced in 2022 and builds on previous climate action plans, which set a roadmap to halve Ireland's emissions by 2030 and reach net zero no later than 2050.

The Plan sets out how Ireland can accelerate the actions that are required to respond to the climate crisis, putting climate solutions at the centre of Ireland's social and economic development.

The updated action plan has a greater focus on system change and recognises the milestones already achieved such as the start of Ireland's offshore wind energy programme. The Plan lists

six vital high impact sectors, with Powering Renewables identified as being critical to decarbonising the power section as well as enabling the electrification of other technologies.

The Plan outlines the current state of play across key sectors including Electricity, Transport, Built Environment, Industry and Agriculture and charts a course towards ambitious decarbonisation targets. The Plan also acknowledges that some sectors and communities will be more impacted than others with the costs of transition to a low carbon economy. To address this, the Plan embodies Just Transition principles and a Just Transition Commission will be established to provide advise to the Government.

The Plan retains one of the most important measures of the previous action plan (CAP21) which is to increase the share of electricity demand generated from renewable energy sources to up to 80% by 2030.

The Plan notes that in 2020 42% of all electricity generated in Ireland came from renewable sources, while in 2021 electricity accounted for just 14.4% of Ireland's greenhouse gas emissions.

Prior to CAP21, climate action plan policies estimated a reduction in electricity emission to 4-5 MtCO2 eq by 2030. Under CAP21 and CAP23, it is recognised that a significant step up is now required to meet 2030 targets and to deliver a decarbonised economy for Ireland by 2050

In the context of rising energy demand, significant progress in renewable electricity deployment will need to continue, with an increased deployment rate of all renewable electricity technologies, to be delivered by 2030:

- At least 5 GW of offshore wind capacity;
- 8 GW of solar PV capacity including 2.5 GW of non-new grid solar; and
- 9 GW total of onshore wind capacity.

The Plan identifies the following key measure to ensure a security of electricity supply and a reduction in emissions:

"The CRU and EirGrid will ensure an adequate level of conventional dispatchable generation capacity and deliver at least 2 GW of new flexible gas-fired generation."

4.4 NATIONAL POWER GENERATION CAPACITY CONTEXT

4.4.1 DS3 Programme

In response to the binding European and national total energy consumption targets EirGrid began a multi-year programme, "Delivering a Secure, Sustainable Electricity System" known as the DS3 Programme. To date the DS3 Programme has enabled EirGrid to increase levels of renewable generation on the system from 50% to 65%, with the aim to increase levels to 75% gradually over the coming years and ultimately achieve 95% renewable generation by 2030.

The DS3 Programme is designed to ensure that the increasing amount of renewable energy required on the Irish power system can operate in an efficient, secure and safe manner. The national power system operates on a synchronous system, whereby electricity is generated at a single synchronised AC frequency. Ireland and Northern Ireland form such a system – all of the conventional generators on the island run in synchronism, producing electricity at 50Hz.

Synchronous generation produces the same amount of electricity all the time. It is reliable and predictable and, therefore, easy to bring onto the grid. Fossil fuel generation, using coal, oil and gas are a type of synchronous generation.

Non-synchronous generation produces a different amount of electricity depending on the energy available. It does not produce the same amount of electricity all the time. This makes it less reliable, and more difficult to bring onto the grid. Most renewable forms of energy, such as wind and solar, are types of non-synchronous generation. This is because the amount of wind and light is always changing and therefore, they cannot produce power predictably.

The growth of renewable energy generation, which is a non-synchronous system of power generation, presents a range of operational challenges for the power system. This non-synchronous technology poses challenges for EirGrid in maintaining power system stability and security due to the inherent variability of renewable energy which is dependent upon climatic conditions. This variability must be managed to ensure demand for electricity is met at all times.

One of the key areas in the DS3 Programme is System Services. EirGrid wants to make sure that the system operates securely and efficiently, while facilitating higher levels of renewable energy. To achieve this aim, it is working to obtain a range of services from as wide a pool of generators and market participants as possible. This includes the development of financial incentives for better plant performance.

The provision of the proposed substation as part of the associated power plant in Profile Park will help EirGrid in managing the integration of renewable energy generators into the electricity grid by providing quick response capabilities in two ways. Firstly, the associated power plant will have the capability of providing DS3 services that EirGrid will require to maintain system stability. Secondly, when requested by the grid operator, the power plant will have the capability to start up and reach full load quickly, so assisting in providing electricity, during periods of high demand. These capabilities will mean that Ireland can continue to invest in renewable sources of power.

The proposed substation will facilitate this connection by exporting electrical power generated from the power plant's main transformers through the proposed Baldonnell Substation to the existing Barnakyle 110kV substation, which is operated by EirGrid and owned by ESB.

4.4.2 Strategy 2020-25 Transform the Power System for Future Generations

EirGrid Group published a five-year strategy in September 2019 outlining a strategic response to the transition of electricity generation to a sustainable low-carbon future. EirGrid Group has a unique role in leading the transformation of the All-Ireland electricity system as the operator and developer of the transmission grid on an all-island basis.

The primary goal of the strategy is to support the continued decarbonisation of electricity generation within Ireland in response to the climate crisis. As coal, peat and oil-burning electricity generation is phased out during the period up to 2030 the generation of renewable energy will be pivotal in the significant transformation of the All-Ireland electricity system. The future operation of the electricity system will be required to be more dynamic and responsive, consequently, improvements to infrastructure are required to consolidate the strength and flexibility of the transmission grid to accommodate for an additional 10,000 megawatts of renewable generation to the electricity system. EirGrid aim to achieve this through using both innovative and proven technologies to ensure the reliability of the electricity system. This includes gas fired power plant which provide the system services as outlined in the DS3 Programme in Section 4.2.1.

Source: Strategy 2020-25, EirGrid Group, September 2019

Figure 4-3:Primary and Supporting Goals of Strategy 2020-25

4.4.3 East Coast Generation Opportunity Assessment (EirGrid, February 2019)

In this assessment, EirGrid acknowledges that offshore wind generation will play a key part in meeting Ireland's 2030 climate change targets. It is expected that the initial phases of offshore wind generation development in Ireland will be focused on the East coast of the country.

In tandem with the development of offshore wind generation, EirGrid note that it has also had numerous enquiries about the connection of large, conventional thermal generation projects in and around Dublin. Electricity demand is increasing rapidly in the greater Dublin region primarily due to the growth of data centres which require large amounts of power. It is likely that both offshore wind and new thermal generation will be required to meet the growing electricity demands in the eastern region.

The East Coast Generation Opportunity Assessment presents analysis that EirGrid has undertaken to identify the opportunities for connecting new power generation sources in the East coast region of Ireland from a grid capacity perspective. The analysis provides useful information for developers seeking to connect generation in the region.

The results indicated that locations close to the Dublin load centre and/or with multiple 220 kV connections into the Dublin area have the best opportunities for new generation capacity.

4.4.4 Shaping our Electricity Future Roadmap (2021)

In autumn 2021 EirGrid published "Shaping Our Electricity Future Roadmap", a policy document to advise and guide stakeholders on the optimal path for delivery of a renewable-based power system. As set out in Section 1.3.4 above, the National Energy and Climate Plan 2021 – 2030 set a target of 70% RES-E.

This paper indicates that Ireland has an installed dispatchable generation capacity of 7,252 MW with Section 2.2.1.2. stating that:

> "*New dispatchable resources are needed to ensure that the generation portfolio continues to meet reliability standards and that demand can met on low RES output days. Gas-fired generation is expected to continue to play an important role, replacing retiring conventional plant and providing the multi-day capacity required to ensure security of supply during prolonged periods of low wind. This capacity is especially important when large continental scale weather patterns affect the availability of RES in Ireland and in neighbouring electricity systems.*"[1]

In addition, the paper provides a breakdown of anticipated energy requirements from each sector up to the year 2030. This assessment has identified large energy users such as data centres as the primary driver of demand, requiring 9.8-12.6 TWh by 2030.

4.4.5 Generation Capacity Statement 2022-2031

The Generation Capacity Statement (GCS), is an annual report from EirGrid and System Operator Northern Ireland (SONI), produced to examine the balance between electricity demand and supply on the island of Ireland for the following 10 years.

This year's GCS predicts a challenging outlook for Ireland with capacity deficits identified during the 10 years to 2031. In the short term the deficits will increase due to the deteriorating availability of power plants, resulting in their unavailability ahead of intended retirement dates.

The GCS identifies Data Centres as key drivers of electricity demand in Ireland for the next number of years. It further states that "demand from data centres and new large energy users is expected to continue to rise as these customers build out towards their contracted load. Almost all of this is in the Dublin region."

Under a medium demand scenario, energy demand is forecasted to increase 37% by 2031, as illustrated in figure 4-4 below.

[1] Shaping our electricity Future.," 2021, EirGrid, p.9

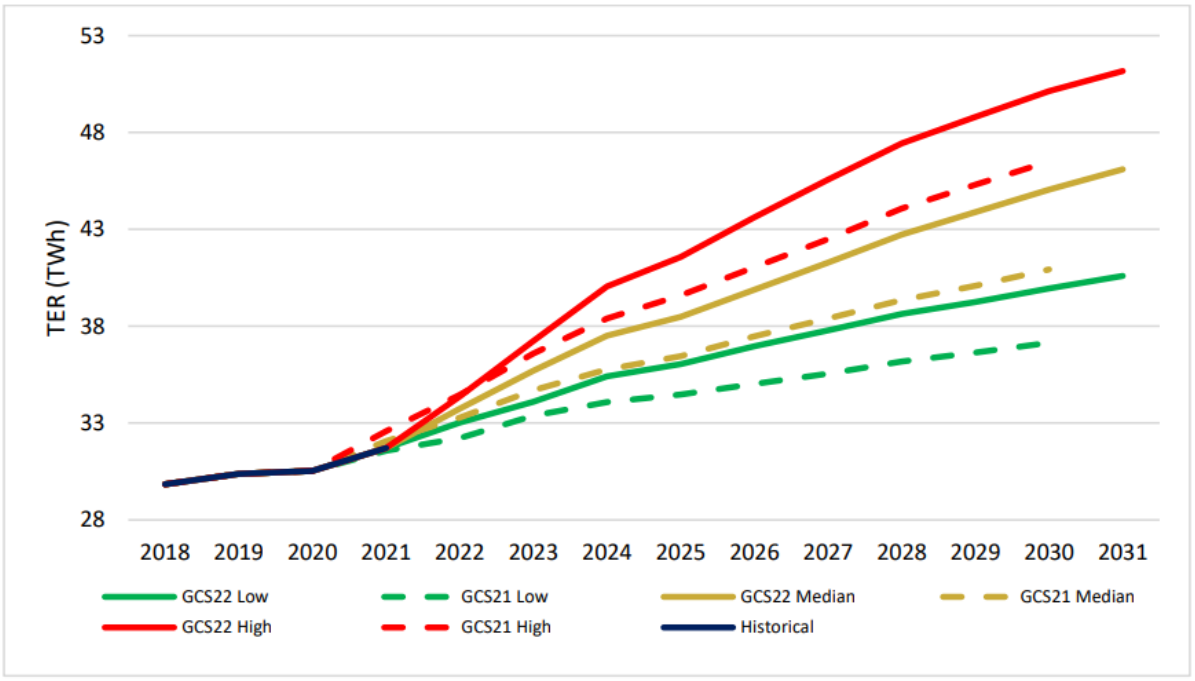


Figure 4-4: Total Electricity Requirement Forecast for Ireland 2021 -2031

Figure 4-5 below indicates that traditional residential, commercial and industry sectors will remain relatively consistent across the decade with the largest growth in demand estimated to come from Data Centres and new large energy users, as well as increased demand as a result of an increased uptake of electric vehicles and heat pumps.

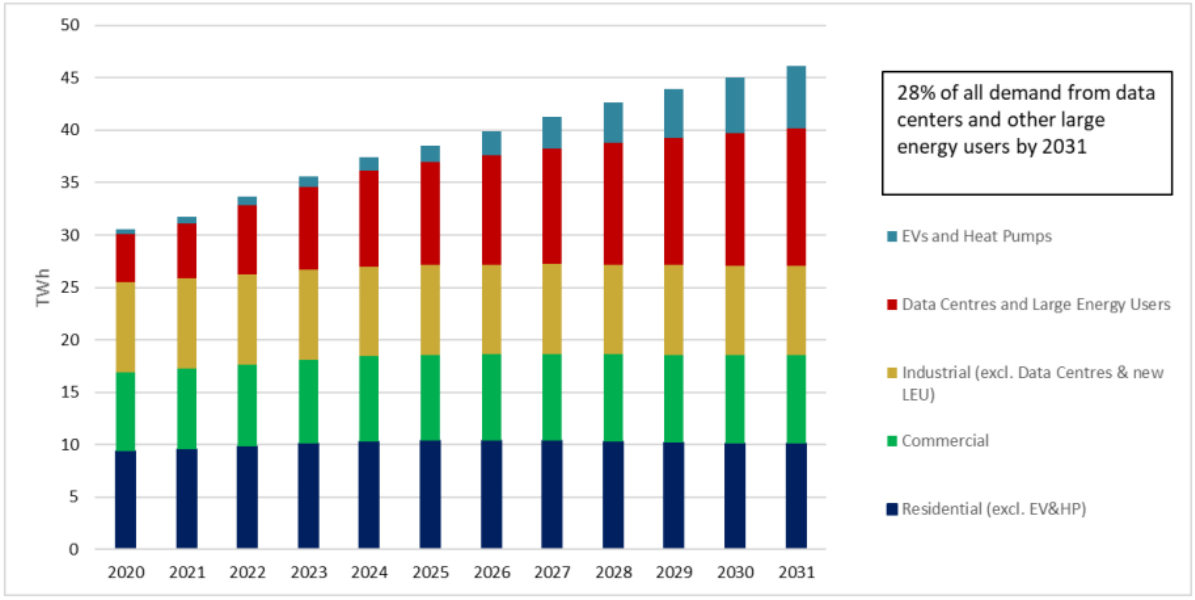


Figure 4-5: Ireland Median Demand Scenario illustrating the approximate spilt into different sectors

The adequacy assessment of Ireland system shows an initial deficit position in all of the core scenarios and remains in deficit over the study horizon, with significant capacity deficits in 2024 and 2025:

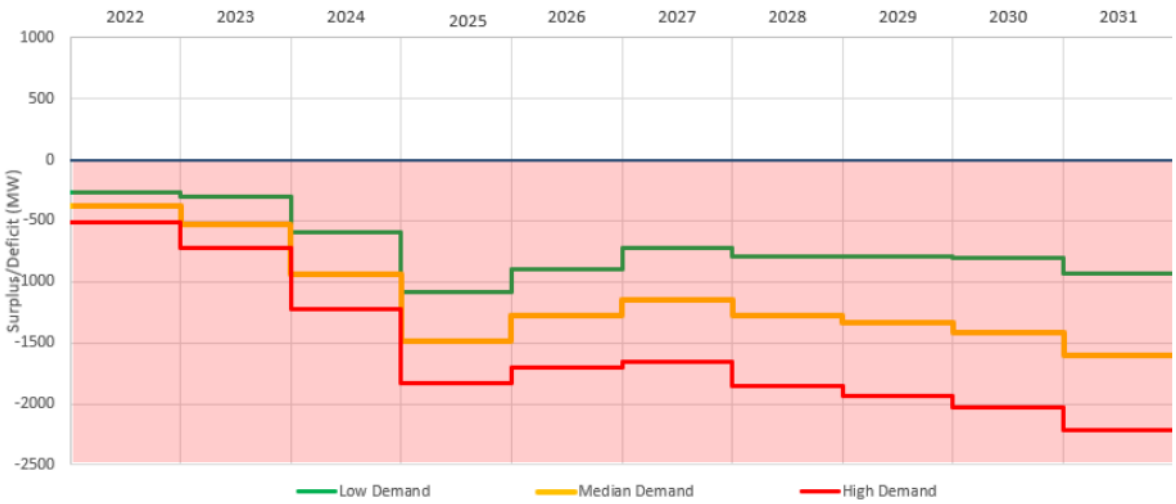


Figure 4-6: Core Scenario Adequacy Results for Ireland, in terms of surplus or deficit of plant.

4.4.6 Government Statement on the Role of Data Centres in Ireland's Enterprise Strategy (2022)

This government policy recognises that data centres are core digital infrastructure and play an indispensable role in our economy and society. The policy seeks to facilitate "twin transitions' with respect to the digitalisation and decarbonisation of Ireland, meaning that digital infrastructure and climate change policies must be jointly deployed and complementary of each other.

The strategic approach aims of this Government Statement is to:

- Drive Ireland's ambition in the digital economy as a location of choice for investment and a seedbed for technology entrepreneurship across a range of sectors and activities;
- Contribute to regional development, deliver associated economic activities and support the creation of high quality, sustainable jobs;
- Align enterprise electricity demand with generation capacity and transmission planning; and
- Ensure that potential downside costs are minimised and that economic impact is optimised.

The plan-led approach aligns with the objective set out in the NPF for the 'promotion of Ireland as a sustainable international destination for ICT infrastructures such as data centres and associated economic activities' and to deliver on the National Strategic Outcome 5 'A strong economy supported by enterprise, innovation and skills'.

The Government Statement acknowledges that data centres are central to the digital economy. They generate added economic benefit across the value chain. Data centres provide remote support functions for other firms which themselves undertake production, research and development, marketing, sales, service, and support activities in locations with no physical/geographic connection to the data centre.

Specifically in the case of the proposed substation and associated power plant in Profile Park, the following is noted:

> *"Ireland's electrical power needs are serviced by just over 10,000 MW of generation capacity, a 500 MW EWIC Interconnector to Britain, and 185,785 km of 400 kV, 275 kV,*

220 kV, 110 kV, 38 kV, medium and low voltage transmission and distribution circuits, of which the high and medium voltages all serve data centres.

The last 4 years have seen annual increases in electricity demand usage of around 600 GWh from data centres alone – equivalent to the addition of 140,000 households to the power system each year. EirGrid predicts that if all contracted capacity were connected, data centres would make up between 25% and 33% of Ireland's electricity demand by 2030. These forecasts are based on data centre projects already contracted to connect to the electricity system, which are all located in the Greater Dublin region. New data centre projects, not yet contracted to the electricity system, would only further increase electricity demand. EirGrid is aware of up to 1GW of these prospective data centre projects. This would present additional challenges for grid capacity and the emissions targets set for the electricity sector in the Climate Action Plan.

In addition, many of these data centres require significantly large loads at a specific site. The average size of a data centre connection request to EirGrid is for a capacity of 80 MW. This has ramifications not only for the resilience of transmission network in those regions, but also to power system adequacy at a national level."

4.4.7 Letter of Support

Appendix 4-1 of this EIAr contains a letter of support for the proposed development issued by the CRU.

4.5 SUMMARY OF NEED FOR THE OVERALL DEVELOPMENT

It is now widely recognised that Ireland has substantially and continually failed to meet past climate targets and that it must now significantly improve its performance in terms of decarbonisation in order to meet the 2030 targets that are becoming more important. As demonstrated by the strategic policies and binding targets on greenhouse gas emissions set out within European and national plans, investment in lower carbon technologies for electricity generation is a key prerequisite in achieving Ireland's 2030 renewable energy target and subsequent net zero carbon energy system by 2050. The transformation of the electricity system in Ireland will require the system to be more dynamic and responsive as the challenges of introducing non-synchronised generations sources, such as wind and solar, to a synchronised transmission system are overcome.

Electricity demand is increasing rapidly in the greater Dublin region, mainly due to the growth of data centres. As large consumers of electricity, data centres pose particular challenges to the future planning and operation of a sustainable power system. The growing energy demand within Dublin is recognised within the NPF as it states that improving energy sustainability within Dublin and its surrounding Environs will be a key future growth enabler with regard to population and employment.

The development of onshore and offshore renewable energy is dependent on the implementation of enabling infrastructure, such as the proposed substation and associated power plant at Profile Park.

The proposed substation and associated power plant in Profile Park is considered consistent with the overarching strategy to achieve the binding 2030 emission targets, as a lower-carbon generation source it will also be a vital technology to mitigate the deficiency in electricity generation following the planned closure of fossil fuel power plants across the island of Ireland in the next six years. The power plant also represents an important electricity generation source

for Ireland's transition to a low carbon economy, which will require local agile distributed generation rather than relying on large, centralised power generation. Gas fired power plant technology allows the delivery of an efficient, safe and secure electricity system by helping to manage fluctuating electricity demands and compensate for shortages occurring from wind or solar power.

The proposed substation and its associated power plant at Profile Park will support the expansion of offshore wind generation in the Dublin region and the reinforcement of Ireland's energy distribution network will facilitate planned growth and energy provision across the country.

5.0 CONSIDERATION OF ALTERNATIVES

5.1 INTRODUCTION

This chapter provides an analysis of alternatives which have been considered as part of this development in terms of the following;

- Do Nothing' Scenario';
- Alternative Technologies;
- Alternative Locations;
- Alternative Process;
- Alternative Layouts; and
- Alternative Mitigations.

5.2 DO NOTHING SCENARIO

In the Do-Nothing scenario, Greener Ideas Limited would not develop a substation in Profile Park. In the absence of this substation, there would be:

- No method for electrical power generated at the adjacent powerplant site to be exported to the wider transmission network.
- Less integration of renewable technologies onto the Irish Grid which is one of the key strategic European and national objectives for the transition to a low carbon economy as set out in Chapter 4.0.
- Increased risk that older, less efficient and more polluting power plants would continue to operate and that proposals to decarbonise Ireland's power generation portfolio would be negatively impacted.
- The portfolio of dispatchable gas fired power plants available to manage fluctuating electricity demands and compensate for shortages occurring from wind or solar power would be reduced and this would result in increased grid instability.
- With respect to EirGrid's Data Centre Connection Policy, the absence of a substation for the associated power plant, raises the possibility that data centres will not develop on Profile Park, or they will seek to build their own power generating capability. However, the ability to centralise power generation within Profile Park, brings opportunities to better manage noise and emissions locally and potentially enabling lower built capacity, and less operating hours.
- The site on which the substation is proposed would more than likely remain unused, vacant and unchanged as a greenfield site.
- Given the size of the site, its unlikely to be developed by another developer despite the 'Enterprise and employment' zoning of the site under the South Dublin County Development Plan 2016-2022.

5.3 ALTERNATIVE CONNECTION POINTS AND TECHNOLOGIES

Greener Ideas Ltd submitted a grid connection application to EirGrid on 17th of November 2021, requesting a 100MW MEC grid connection to the adjacent proposed Kilcarbery Substation as illustrated in Figure 5-1 below. The Kilcarbery substation is proposed to be constructed as part of an adjacent Data Centre development and is currently under consideration by An Bord Pleanála (VA06S.312793).

On 21st of December 2021, EirGrid informed Greener Ideas Limited that for the purposes of the 2023-24T3 Capacity Market Auction, it should assume that the associated gas fired power plant's grid connection method will be 'a new 110 kV Air Insulated Switchgear ("AIS") Station

tailed to the nearby Barnakyle 110 kV Station via 0.375 km of underground cable ("UGC")'. Refer to document OI29074-EGD-XX -XX-XX-DN-62-0001-S2 -PA1 attached in Appendix 5-1

On 14th of April 2022, EirGrid issued Greener Ideas Limited with a Connection Agreement, confirming the connection method and naming the new AIS substation 'Baldonnell'. It is Greener Ideas Limited understanding that due to commercial and planning matters associated with the adjacent proposed Kilcarbery Substation, and to ensure security of supply for the 2024/23 winter period, EirGrid have instructed this connection method to be utilised, as opposed to connection via the adjacent proposed Kilcarbery substation.

5.4 ALTERNATIVE LOCATIONS

No alternative sites have been considered for the proposed substation, as the location of the proposed development was determined with respect to overall siting and design of the associated gas fired power plant. With respect to the location of the associated power plant, the following was considered:

- EirGrid's Data Centre Connection Policy (2020) has identified the greater Dublin region as a capacity constrained area, especially with regard to satisfying the power needs of new data centres. EirGrid will provide firm capacity to a data centre where it provides new on-site dispatchable generation. This can also be facilitated through the installation of generation plant in the close proximity to the data centre, for example through projects such as the power plant in Profile Park. Therefore, the location and importance of the8 power plant at Profile Park is one such that it helps enable additional development on the Profile Park industrial estate, especially with regards to new data centres, who otherwise may need to build this capacity on-site.
- In addition to power supply to data centres, this type of power plant is necessary in order to achieve Ireland's binding 2030 emission targets. These power plants will enable the delivery of an efficient, safe and secure electricity system by helping to manage fluctuating electricity demands and compensate for shortages occurring from renewables such as wind or solar power.
- Another critical location consideration was proximity to electricity grid and gas transmission networks and data centre developments on appropriately zoned lands:
    - *Profile Park is located immediately adjacent to the Castlebaggot 220 / 110 kV Substation and also within 1km of Gas Networks Ireland gas network near the Nangor Road; and*
    - *Profile Park, and its neighbouring lands, are also home to a number of existing data centre tenants including Google, Microsoft, Digital Realty Trust, Telecity and others. Much of the lands are zoned by South Dublin County Council to 'To provide for enterprise and employment related uses' which indicated that there is potential for future data centre development in the future.*

These factors influenced Greener Ideas Limited to contact Moffash Limited, the owners of Profile Park, to discuss the possibility of developing the gas fired power plant on its lands. These discussions resulted in an agreement to locate the proposed Baldonnell substation at the site which is considered in this EIA Report.

5.5 ALTERNATIVE SITE LAYOUT AND CABLE ROUTE SELECTION

Greener Ideas Limited considered an alternative site layout and cable route configuration which is presented below in Figure 5-1 and 5-2. The proposed site layout was arrived at following extensive discussions between the Applicant, Greener Ideas Limited and EirGrid/ESB.

This configuration comprised of similar plant and equipment however the overall layout differed from the layout which has been subject to consideration as part of this EIA Report. For example, access to the IPP compound has been relocated to be contained within the associated gas fired power plant site. This has resulted in a shift in the layout of infrastructure on site, most notable the movement of the IPP compound to the middle of the site. Accordingly, the associated grid connect UGC route has been altered to exit the north of the site, instead of the previous original design to connect into the adjacent proposed Kilcarbery substation.

This alternative layout would have resulted in a comparable environmental impact as the development was similar and environmental impacts such as landscape and visual, cultural heritage and traffic etc, would be comparable given the same baseline environment and scale of development. The design was ultimately discounted for the following reasons.

1. Preferred route reduced the number of 90-degree bends, so eliminating the need for the construction of Joint bays and allow the possible installation of the cable in a single pull.
2. Alternative cable route involved crossing 3rd party lands.
3. Alternative land would conflict with the possible future construction of the Kilcarbery GIS substation.
4. Alternative route would require the reconfiguration of the already approved GIL 15/110kV transformer, which received planning approval under application reg. SD21A/0167.

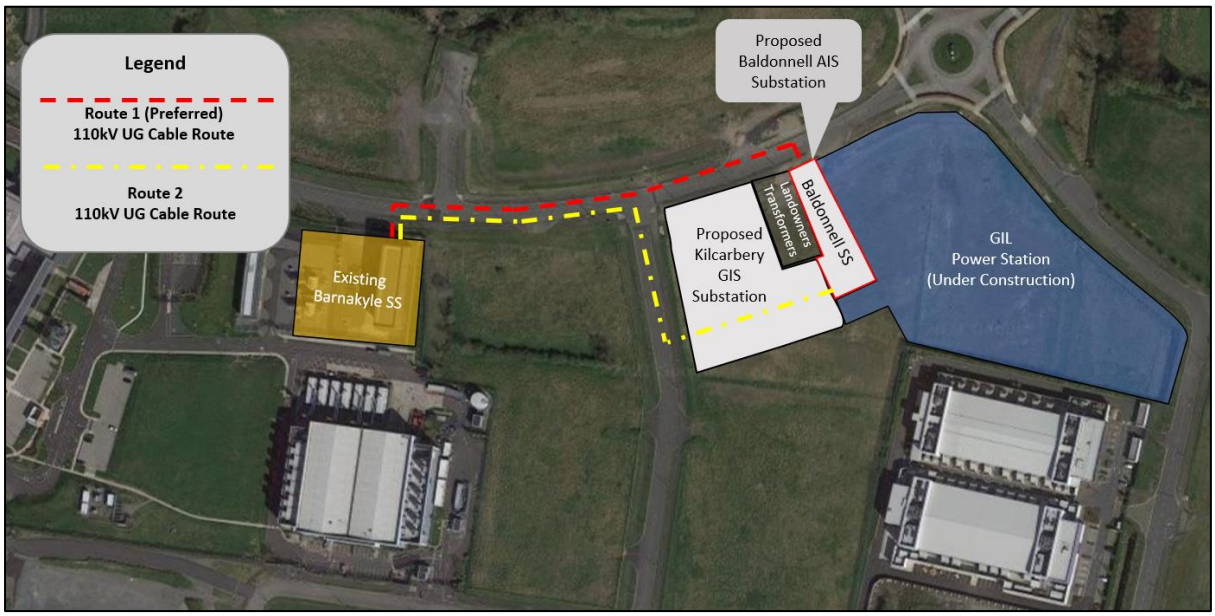


Figure 5-1: Alternative Cable Connections

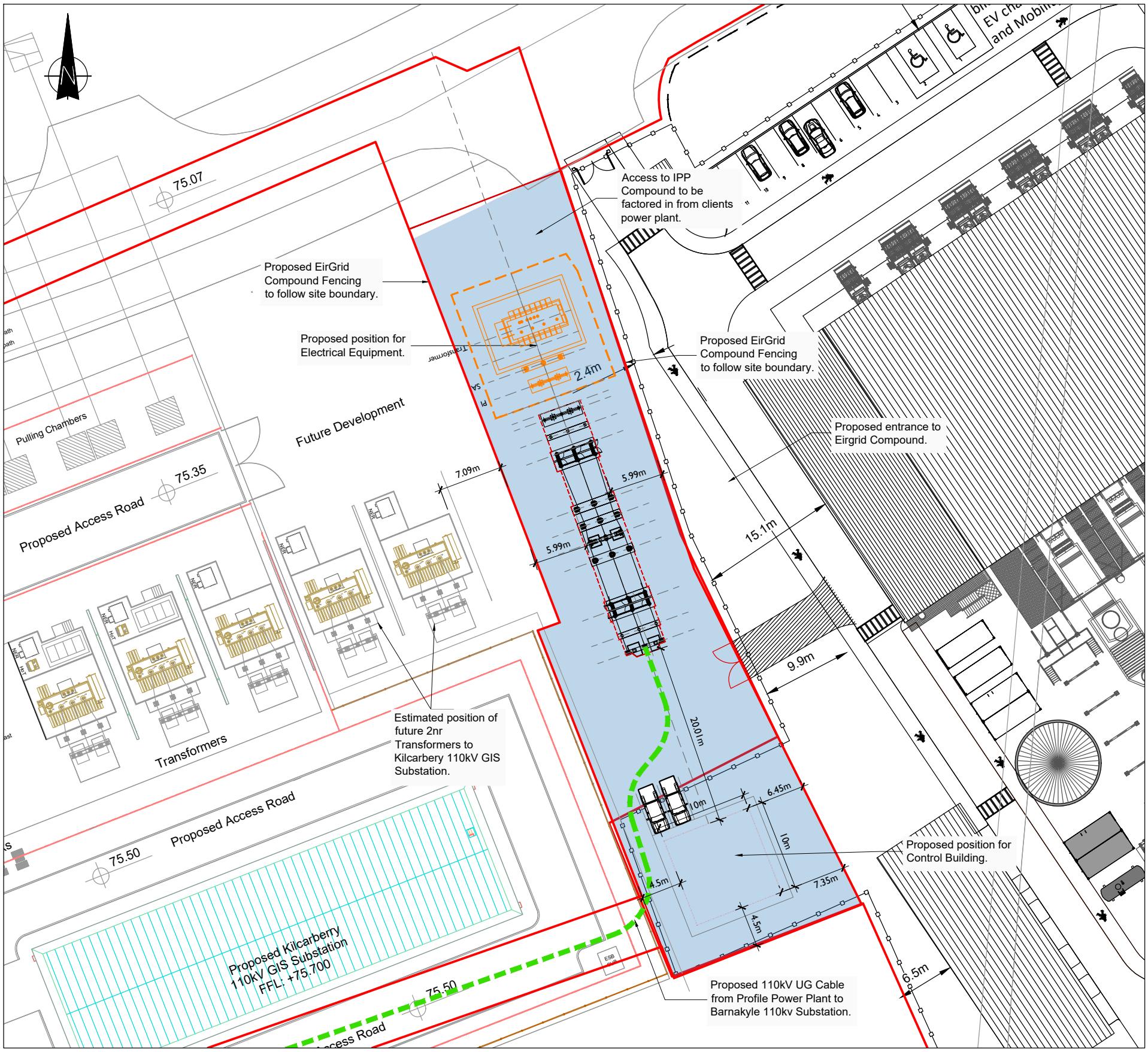
5.6 ALTERNATIVE CONSTRUCTION AND DECOMMISSIONING PRACTICES

Construction practices for the proposed Baldonnell substation are well understood and there are several thousand such plants in operation across the globe. Standard construction practices will be employed in the construction of this plant. Similarly, decommissioning practices will follow standard practices and will be carried out in accordance with EPA requirements as set

out in the IE Licence. No alternative construction or decommissioning practices are considered in this EIAR as best practice or other regulatory requirements will be followed in all instances.

Project Management Initials: Designer: GD Checked: GH Approved: RG

ISO A3 297mm x 420mm



Proposed AIS Tail Station Layout Plan requiring derogation [Option B]

Scale : 1:500

PLAN LAYOUT - LEGEND

- Proposed 110kV UG Cable to Barnakyle 110kV Substation shown thus
- Area available by client for Eirgrid AIS Tail Substation shown thus
- Required Eirgrid AIS Substation requiring derragation shown thus
- Proposed IPP Compound shown thus

NOTES:
- This drawing is to be read in conjunction with relevant drawings, specifications and reports.
- Dimensions are in Meters, unless noted otherwise.
- Drawings are not to be scaled. Use figured dimensions only.

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CLIENT

Bord Gáis Energy

PROJECT

GIL - Profile Park Grid Connection

SHEET TITLE

Profile Park - Site Layout Plan showing proposed EirGrid 110kV Compound Layout - Option B.

DRAWING STATUS

For Information (Sketch)

LEGEND/NOTES: -

PROJECT NUMBER

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6.0 PLANNING POLICY

6.1 INTRODUCTION

This chapter of the EIAR sets out the regional and local planning policies and objectives that are relevant to the proposed Baldonnell 110KV substation and its associated grid connection (hereafter referred to as the proposed development) and demonstrates how the proposed development will be consistent with and contribute towards the achievement of same. Relevant spatial planning objectives and the relevant planning history of the surrounding area is also analysed.

6.2 EUROPEAN AND NATIONAL POLICY CONTEXT

It should be noted that the European and National policy framework which establishes the need and overall development context for the proposed substation and associated gas fired power plant is already provided in Chapter 3.

The European policy context includes:

- European Green Deal;
- A Clean Planet for all: A European strategic long-term vision for a prosperous, modern, competitive and climate neutral economy (2018);
- Europe 2030 Climate and Energy Framework; and
- Renewable Energy Directive 2009/28/EC & 2018/2001/EU.

The national policy context includes:

- Ireland 2040 - Our Plan (National Planning Framework) [2018];
- National Development Plan 2021-2030;
- Government White Paper – Ireland's Transition to a Low Carbon Energy Future 2015-2030;
- Climate Action Plan 2023;
- DS3 Programme;
- Strategy 2020-25 Transform the power system for future generations;
- East Coast Generation Opportunity Assessment (EirGrid, February 2019);
- Shaping our Electricity Future Roadmap (2021); and
- Generation Capacity Statement 2022-2031;
- Government Statement on the Role of Data Centres in Irelands Enterprise Strategy (2018).

6.3 REGIONAL POLICY CONTEXT

6.3.1 Regional Spatial and Economic Strategy for the Eastern and Midland Region

The Greater Dublin Area was amalgamated within the Eastern and Midland Regional Assembly (EMRA) as of January 2015. One of the principal functions of the Assembly is to deliver a Regional, Spatial and Economic Strategy (RSES) which considers both spatial and economic factors within the regional planning framework. The principal statutory purpose of the RSES for the Eastern and Midland Region is to support the implementation of the Ireland 2040 NPF / NDP and the economic policies and objectives of the Government. Specifically, the RSES will provide a range of plans and strategies relevant to the Ireland 2040 NPF / NDP.

The RSES sets out a Vision Statement which is underpinned by three key cross-cutting principles which best reflect the challenges and opportunities of the Region: healthy placemaking; climate action; and economic opportunity.

To create a sustainable and competitive Region that supports the health and wellbeing of our people and places, from urban to rural, with access to quality housing, travel and employment opportunities for all.

The RSES contextualises the Eastern and Midland Region as the '*economic engine of the State*' providing more than 1 million jobs. Specifically, Dublin and its Environs is a global hub for international investment and high value jobs in ICT, financial and business services with local enterprise and small and medium sized enterprises (SMEs) also providing vital employment opportunities. Consequently, the region contains some of the fastest growing communities in the country which has increased demand for housing, infrastructure and services in those areas. As such, the RSES states that a key growth enabler for the Dublin is to:

'*Support the future success of Dublin as Ireland's leading global city of scale by better managing strategic assets to increase opportunity and sustain national economic growth and competitiveness*'

The RSES includes a Dublin Metropolitan Area Strategic Plan (MASP) which identifies a number of Guiding Principles for the sustainable development of the Dublin Metropolitan Areas which includes the site of the gas fired power plant and associated proposed development. Of particular relevance, the MASP notes the need to promote quality infrastructure provision and capacity improvement, in tandem with new development and aligned with national projects and improvements in sustainable energy and resource efficiency.

According to the RSES, the Dublin and Eastern Regions are a major load centre on the Irish electricity transmission system; specifically, approximately one third of total electricity demand is located in these regions. Having regard to projected population and economic growth in the eastern region, the RSES notes that the increasing demand for electricity in the region must be addressed in a way which balances the need for a significant shift towards renewable energy and enabling resources to be harnessed in a manner consistent with the principles of proper planning and sustainable development.

- Facilitating the provision of appropriate renewable energy infrastructure and enabling technologies;
- Expansion and upgrading of the grid with the aim of increasing the share of variable renewable electricity;
- Moving from carbon intense fossil fuel generation to lower emissions fuels such as natural gas; and
- The need to ensure sufficient electricity to meet increased demand.

Developing the grid in the Region will enable the transmission system to safely accommodate more diverse power flows from renewable generation and also to facilitate future growth in electricity demand. These developments will strengthen the grid for all electricity users, and in doing so will improve the security and quality of supply.

The following Regional Policy Objectives outlined below ensure that the development of the energy network is undertaken in a safe and secure way which meets the projected demand levels, Government Policy and the need to achieve a long-term, sustainable and competitive energy future for Ireland:

- RPO 10.20: Support and facilitate the development of enhanced electricity and gas supplies, and associated networks, to serve the existing and future needs of the Region and facilitate new transmission infrastructure projects that might be brought forward in the lifetime of this Strategy;
- RPO 10.22: Support the reinforcement and strengthening of the electricity transmission and distribution network to facilitate planned growth and transmission/distribution of a renewable energy focused generation across the major demand centres to support an island population of 8 million people; and
- RPO 10.23: Support EirGrid's Implementation Plan 2017-2022 and Transmission Development Plan (TDP) 2016 and any subsequent plans prepared during the lifetime of the RSES that facilitate the timely delivery of major investment projects subject to appropriate environmental assessment and the outcome of the planning process.
- RPO 7.35: EMRA shall, in conjunction with local authorities in the Region, identify Strategic Energy Zones as areas suitable for larger energy generating projects, the role of community and micro energy production in urban and rural settings and the potential for renewable energy within industrial areas. The Strategic Energy Zones for the Region will ensure all environmental constraints are addressed in the analysis. A regional landscape strategy could be developed to support delivery of projects within the Strategic Energy Zones.
- RPO 8.25: Local authorities shall:
  - Promote and facilitate the sustainable development of a high-quality ICT network throughout the Region in order to achieve balanced social and economic development, whilst protecting the amenities of urban and rural areas.
  - Support the national objective to promote Ireland as a sustainable international destination for ICT infrastructures such as data centres and associated economic activities at appropriate locations.
  - Promote Dublin as a demonstrator of 5G information and communication technology.

As described within this EIAR, the proposed development is consistent with the above objectives.

6.4 LOCAL POLICY CONTEXT

6.4.1 Policy & Objectives Overview

The proposed Baldonnell Substation will be located within the functional area of South Dublin County Council and is therefore subject to the South Dublin County Council Development Plan 2022-2028 hereafter referred to as the CDP.

Noting the overall context and purpose of the proposed development to export electricity from the adjacent gas fired power plant to the wider transmission network, this section of the chapter will set out policy and objectives relevant to the delivery of electricity infrastructure, renewable energy, and employment and enterprise.

A vision of the CDP is to "Deliver a green society and circular economy adaptable to new technologies, a home and place of employment for people and industries striving towards reducing their carbon footprint."

Chapter 10 of the CDP deals with Energy and states that South Dublin Council will "continue to make every effort to increase energy efficiency and unlock renewable energy potential in the County."

The CDP seeks to promote policy to ameliorate the effects of climate change by making Dublin a climate resilient region by reducing the impacts of future climate change related events.

Specifically, with respect to Electricity Infrastructure, the CDP states:

> *"In line with government policy, the development of energy networks in a safe and secure way to meet projected demand levels and to ensure a long-term, sustainable and competitive energy future for Ireland will be critical to our economy and to enabling the relevant grid connections for renewable energy."*

Within this context, the following objectives and policies are provided within the CDP and are of relevance to the proposed substation:

- Policy IE6 Electricity Infrastructure: Protect the existing electricity infrastructure and support the development of a safe, secure and reliable supply of electricity and the development of enhanced electricity networks as well as new transmission infrastructure projects subject to the relevant environmental assessments.
- IE6 Objective 2: To support the reinforcement and strengthening of the electricity transmission and distribution network to facilitate planned growth and transmission /distribution of a renewable energy focused generation in line with RPO 10.22.
- IE6 Objective 4: To ensure that the design of energy networks achieves the least possible environmental impact and that where such impacts are inevitable, they are mitigated to the greatest possible extent.

Energy objectives and policies provided within the CDP to support this vision objective are:

- E2 Objective 1: To seek to reduce the reliance on fossil fuels in the County by reducing the energy demand of existing and new development.
- E2 Objective 3: To promote the generation and supply of low carbon and renewable energy alternatives, having regard to the opportunities offered by the settlement hierarchy of the County and the built environment.

The CDP recognises Grange Castle Business Park as "a modern business park located in the west of the County with capacity to attract large scale industries of regional, national and international significance, due to the availability of large plot sizes, infrastructure and corporate park style environments." The areas have "attracted a significant number of blue-chip national and multi-national corporations. Significant investment has been made over the past two decades in infrastructure and services to support these economic areas. Grange Castle Business Park is identified in the MASP as a strategic development area for the promotion of high-tech manufacturing, research and development."

The concentration of 'clusters' of industries is recognised as a vital part of economic development policy driving investment within South Dublin County Council. As such, the CDP seeks to:

- EDE5 Objective 1: To prioritise hi-tech manufacturing, research and development and associated uses in the established Business and Technology clusters to the west of the County (Grange Castle and Citywest areas) maximising the value of higher order infrastructure and services that are required to support large scale strategic investment.
- EDE1 Objective 3: To ensure that there is a sufficient supply of zoned and serviced lands at suitable locations to accommodate a range of enterprise and employment development types and to promote compact growth by strengthening the integration between employment, housing and transportation.

The CDP acknowledges that "Dublin is one of the fastest growing data centre markets in Europe with a significant element of this growth in South Dublin County Council"

Categorised as "space extensive land uses" under the CDP, the CDP recognises that data centres can have a high carbon footprint. This is due to the "large amount of energy demanded by them."

6.4.2 Land Use Zoning

The CDP sets out a range of land use zoning objectives within South Dublin County Council in order to promote the orderly development of the County by eliminating potential conflicts between incompatible land uses and to establish an efficient basis for investment in public infrastructure and facilities.

The application site is situated within land designated as "Employment and Enterprise" under the CDP. The objective of 'Enterprise and Employment (EE)" Zoning is to provide for enterprise and employment related uses.

Land Use Classes identified as 'Permitted in Principle' within EE zones include, Public Services, which is further defined as:

"A building or part thereof or land used for the provision of public services. Public services include all service installations necessarily required by electricity, gas, telephone, radio, telecommunications, television, drainage and other statutory undertakers, it includes public lavatories, public telephone boxes, bus shelters, bring centres, green waste and composting facilities."

The proposed substation is consistent with EE zoning objectives and furthermore, sympathetic to the overall development strategy of the surrounding environment as envisioned in the CDP.

The precedence for the siting of a gas fired power plant and associated infrastructure such as the proposed substation is well established within this zoning given the following grant of approvals:

- 96MW Peaker Power Plant at Grange Castle Business Park, Clondalkin, Dublin 22, 1.56km north of the site (Reg. Ref.: SD15A/0061 & SD16A/0398);
- Gas power plant development within the townland of Milltown (Reg. Ref.: SD20A/0058);
- Temporary gas-powered generation plant at Newcastle Road, Lucan, Co Dublin, 1.82km northwest of the site (Reg. Ref.: SD19A/0042);
- Temporary provision of 18MW gas powered electricity generator compound at Grange Castle Business Park, approximately 560m northwest of the site (Reg. Ref.: SD17A/0318);
- Temporary provision of gas-powered generation plant permitted under (Reg. Ref.: SD20A/0031) at Grange, Newcastle Road, 1.75km northwest of the site; and
- Reg. ref.: SD20A/0283 provides for the construction of a data centre and administrative buildings including the provision of a gas generator compound.

6.4.3 Planning History of Application site and Environs

Power generation, transmission and general industry/ commercial activities have long been established within the application site and surrounding area. A summary of the relevant planning history of the application site and surrounding environs is provided hereunder.

There are three planning applications overlapping the boundary of the site relating to the provision of the original business park:

- Provision of roads and services infrastructure to facilitate a business park (Reg. Ref.: SD06A/0568 & SD06A/0568 EP)
- Provision of a Trade Park consisting of 35 units in 5 separate blocks (Reg. Ref.: SD07A/0665)

The associate gas fired power plant received planning approval under application Reg. Ref.: SD21A/0167.

The majority of commercial planning applications within the last 5 years have been clustered north and south of the R134 within Grange Castle Industrial Park and on lands zoned 'Enterprise and Employment'. These applications generally consist of data centres with administrative office and associated infrastructure such as backup generator units, substations, and flue stacks, as well as warehouse infrastructure and bi-pharma manufacturing facilities:

- Construction of peaking power plant (Reg. Ref.: SD15A/0061 & SD16A/0398)
- Construction of telecommunications infrastructure (Reg. Ref.: SD16A/0113)
- Construction of data centres:
  - (Reg. Ref.: SD16A/0345, SD17A/0027 & SD19A/0342)
  - (Reg. Ref.: SD19A/0042, SD19A/0004)
  - Reg. Ref.: SD17A/0141 & SD17A/0392, SD18A/0298, SD20A/0031)
  - (Reg. Ref.: SD15A/0343, SD16A/088, SD20A/0283)
  - (Reg. Ref.: SD16A/0176, SD16A/0214)
  - (Reg. Ref.: SD17A/0377)
  - (Reg. Ref.: SD18A/0134)
  - (Reg. Ref.: SD18A/0323)
  - (Reg. Ref.: SD12A/0002/EP)
  - Reg. Ref.: SD18A/0314, SD19A/0408, SD20A/0295)
  - (Reg. Ref.: SD20A/0121)
  - (Reg. Ref.: SD21A/0042)
  - (Reg. Ref.: SD21A/0241)
- Construction of gas-powered plant & data hall (Reg. Ref.: SD20A/0058 & SD20A/0324);
- Provision of temporary gas-powered electricity generator (Reg. Ref.: SD17A/0318)
- Construction of above ground natural gas pressure reduction unit relief stack (Reg. Ref.: SD18A/0096 & SD18A/0269)
- Applications involving the provision of a substation:
  - (Reg. Ref.: SD19A/0300)
  - (Reg. Ref.: PL06S.VA0019)
  - (Reg. Ref.: PL06S.308585)
  - (Reg. Ref.: PL06S.309146)
  - (Reg. Ref.: PL06S.309773)
- Construction of bio-pharmaceutical facilities & laboratories:
  - (Reg. Ref.: SD16A/0236)
  - (Reg. Ref. : SD13A/0186, SD15A/0243, SD15A/0352, SD16A/0250)
  - (Reg. Ref.: SD17A/0019)
  - (Reg. Ref.: SD17A/0192)
  - (Reg. Ref.: SD17A/0354)
  - (Reg. Ref.: SD20A/0147)
- Other miscellaneous applications include:
  - Permission for Car Sales Show room (Reg. Ref.: SD17A/03540)

- Permission for warehousing and ancillary office (Reg. Ref.: SD18A/0314, SD19A/0153, SD19A/0322, SD20A/0124, SD20A/0187, SD18A/0126, SD21A/0051)

The only residential development consented within the last 5 years within proximity of the proposed substation has been a Strategic Housing Development (Reg. Ref.: ABP-305267-19), which has obtained permission in 2019 for the construction of 1034 residential units and 2no. childcare facilities, 1 retail unit and 1 community facility. This development would be located 1.23km east of the site. Other applications for residential development in the wider area include:

- Part 8 development to construct Rapid Build Social Housing Project (Reg. Ref.: SD168/0007)
- Part 8 development for construction of 109 residential units (Reg. Ref.: SD178/0002)

Neighbouring Proposed Kilcarbery Substation - It is noted that an application for planning permission for the construction of a 110kV Gas Insulated Switchgear (GIS) Substation compound and 110kV transmission lines along with associated and ancillary works has been lodged with An Bord Pleanála (Reg. Ref.: VA06S.312793) and is currently pending consideration.

The application process for the associated and approved Gas Fired Power Plant has cumulatively assessed application VA06S.312793 with the assessments under this EIAr doing the same.

6.5 PLANNING CONCLUSIONS

The proposed Baldonnell Substation, its grid connection, and the associated power plant at Profile Park is considered consistent with the overarching planning framework set out in the above European, national, regional and local policies and plans. The rationale for this conclusion is based on the following:

European

- Ireland will miss the target set for the period 2013 to 2020 for renewables by about 3% and for cumulative emissions by a little under 5%. Furthermore, EPA's Greenhouse Gas Emissions 2018-2040 projections indicate that Ireland faces significant challenges in meeting EU 2030 reduction targets in the non-ETS sector and national 2050 reduction targets, particularly in electricity generation. Ongoing review and refinement of the national transmission, including the implementation of support / enabling infrastructure such as the proposed substation as part of the associated gas fired power plant, will allow Ireland to continue to invest in renewable sources of power to meet future national and EU targets.

National

- Due to the significant growth in demand for electricity, the national grid will require new solutions such as the proposed substation and associated gas fired power plant. The long-term renewal of the grid will need to be consistent with wider national, social, environmental, economic and energy policies, i.e., renewable energy targets and sustainability. Operation of the proposed substation will assist in regularising energy provision in the electricity grid. Specifically, the associated gas fired power plant would have the ability to respond quickly to the peaks and troughs of renewable generators, so providing electricity at times of high demand and low wind. This will assist in delivering a secure and sustainable electricity system.

Regional

- The RSES contextualises the Eastern and Midland Region as the '*economic engine of the State*' providing more than 1 million jobs, and as such, are a major load centre on the Irish electricity transmission system. Developing the electrical grid in the Region will enable the transmission system to safely accommodate more diverse power flows from renewable generation. Grid investment, and flexible power generation in the form of the power plant, will solve immediate infrastructural deficiencies in addition to accommodating expected long-term growth in population and economic development. Greater integration of renewable energy will ensure grid capacity to meet growing commercial demand such as high technology industries including data centres.

Local

- The policies and objectives contained within the CDP establish a clear precedence for the proposed substation due to the benefits and opportunities of dispatchable grid services, that will be facilitated.
- The proposed substation will be located within land zoned Enterprise and Employment.
- The precedence for the siting of gas fired power plants and associated infrastructure such as the proposed substation, is well established at this location in Profile Park, given the approval of similar development within the same zoning.

7.0 POPULATION AND HUMAN HEALTH

7.1 INTRODUCTION

This chapter examines the existing environment and addresses the potential impacts on population and human health arising from the proposed substation in Profile Park.

The proposed 110kV electrical substation (hereafter referred to as the "Baldonnell Substation") and associated grid connection are being developed to provide a connection from the adjacent peaking power plant to the existing electricity transmission system. Electrical power will be exported from the power plant's main transformers through the proposed Baldonnell Substation to the existing Barnakyle 110kV substation, which is operated by EirGrid and owned by ESB. The associated grid connection works will consist of underground cabling.

The two environmental factors of population and human health are addressed under separate headings. The assessment on population considers the current land use of the proposed substation site, the current activities occurring within and in the vicinity of the site, local population information, employment profiles and tourism.

The study area for population and human health includes review of relevant information on a county and national scale but is mainly concentrated on the Electoral Districts (ED) within which the project is located.

The potential effects of the proposed substation on other environmental factors which may also have an impact on human beings, as set out in Chapter 8 (Land, Soils and Geology); Chapter 9 (Hydrology and Hydrogeology); Chapter 10 (Air Quality and Climate); Chapter 11 (Noise and Vibration); Chapter 14 (Landscape and Visual Impact Assessment) and Chapter 15 (Traffic and Transport), are addressed in this chapter and discussed in more detail in the relevant chapters of this EIAR. A separate section setting out the likely interactions between this assessment and other technical assessments is presented in Chapter 18 (Interaction of the Foregoing).

7.1.1 Proposed Development

7.1.1.1 Substation

The proposed Baldonnell 110kV substation site measures approximately 87.75m long, 22.25m wide and will be bounded by a 2.6m high palisade fence.

The compound will house a 126m² EirGrid 110kV substation control building which will measure 14m long x 9m wide x 6.7m high and will be finished externally with scud render & float in sand, white cement plaster, nap finish. The roof of the building will consist of standard Selected Blue/Black slate finish.

Associated outdoor electrical equipment will include:

- 1 no. 110kV transformer.
- 110kV Switchgear.
- an associated internal 15kV underground cable.
- an internal access track.
- a diesel generator.
- Lightning masts* measuring 18m in height.

- Approximately 15 Light Poles** measuring 3.5m in height.
- 2 no. security cameras and poles will be installed.

The site has been designed to meet EirGrid's specifications.

Access to the substation compound will be provided via the adjacent gas fired power plant site, with 2 no. 4.9m wide access gates proposed along the eastern boundary of the proposed substation site.

*Lightning Mast Design will be subject to a lightning survey and confirmed during the detailed design stage of the project.

** Lamp Poles will be the subject of a light survey and the exact number to be provided will be confirmed during the detailed design stage of the project.

7.1.1.2 Grid Connection

The proposed grid connection will consist of underground cabling (UGC). The underground cable route exits the proposed Baldonnell 110kV Substation from the northside fence and heads in a westerly direction. The route follows the private road (Falcon Avenue) west for approximately 250m until it reaches the entrance to Barnakyle 110kV Substation. The cable then turns south to enter the Barnakyle substation through existing ducts. This section of the route is almost entirely within the road except for the crossover into the substation.

The UGC works will consist of the installation of 6 No. ducts in an excavated trench to accommodate 3 No. power cables, 2 No. fibre communications cable to allow communications between the Baldonnell and ESB Barnakyle 110kV Substation and one earth continuity conductor (ECC).

7.1.1.3 Temporary Construction Compound

A temporary construction compound will be provided approximately 185m southeast of the proposed development site. The compound will comprise of areas for temporary site offices (portacabins), staff welfare facilities, car parking, material and equipment storage and material laydown areas. Potable water, foul water and electrical connections will be provided to accommodate the above. The site of the temporary construction compound will be fully reinstated following the completion of the works.

7.1.2 Statement of Authority

This assessment has been carried out by Serena Byrne, Assistant Project Manager in TOBIN Consulting Engineers. Serena has over 11 years' multidisciplinary experience in engineering and environmental consultancy. Serena has a Master's in Environmental Sustainability from University College Dublin.

7.2 METHODOLOGY

7.2.1 General

This assessment has been carried out in accordance with the following guidelines:

- Department of Housing, Planning and Local Government (DoHPLG), Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (2018);

- Environmental Protection Agency (EPA), Guidelines on the Information to be contained in Environmental Impact Assessment Reports (May 2022); and
- European Commission (EC), Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (2017).

7.2.2 Population

A desktop study was carried out in order to examine relevant information pertaining to population impact assessment. Aerial photography (Google Maps / Google Earth) was used to verify descriptions and information of the local area, and inform the impact assessment.

Maps from Ordnance Survey Ireland (OSI) and the EPA (EPA Maps[1] - CORINE 2018) were used to identify current and historical land use in the area as well as relevant amenity facilities within the main settlement areas proximal to the proposed substation.

The following key information sources and guidance have been used in the completion of the population aspect of this Chapter:

- Central Statistics Office (CSO) - 2006-2016 Census and associated data;
- CSO - Census of the Population 2022 - Preliminary Results;
- Discover Ireland Website - https://www.discoverireland.ie/;
- Fáilte Ireland website - https://www.failteireland.ie/
- Fáilte Ireland, EIAR Guidelines for the Consideration of Tourism and Tourism Related Projects;
- Ireland's Visit Dublin website – https://www.visitdublin.com/
- Fáilte Ireland website information regarding Dublin;
- South Dublin County Development Plan 2022-2028;
- OSI – Mapping and aerial photography.

The effects of the proposed substation on the human environment are assessed in compliance with the EIAR Guidelines as outlined in Chapter 1 (Introduction) of this EIAR.

7.2.2.1 Employment

Information on population statistics, employment and social data for the areas surrounding the proposed substation have been obtained from the CSO and predominantly from the 2016 and 2011 Census records, and 2022 preliminary census data where available. Data has been captured on an Electoral District (ED) basis as this is the most appropriate scale for collated census data and is commonly used for defining the existing population profile. The ED within which the proposed project is located comprised the study area for this assessment.

7.2.2.2 Tourism

Information on other tourist attractions and initiatives in the area have been sourced from relevant websites, such as Discover Ireland, Visit Dublin, Tourism Ireland, those hosted by the Dublin Tourism Board and published literature.

7.2.3 Human Health

Aspects examined in this section primarily relate to impacts from the proposed development on socio-economic activities and on local community health. These two themes are discussed

[1] https://gis.epa.ie/EPAMaps/

primarily in this chapter but may be further addressed in other technical chapters, where relevant.

The following specific guidance documents have been consulted in the completion of the human health impact aspect of this Chapter:

- Institute of Environmental Management and Assessment (IEMA), Health in Environmental Impact Assessment - A Primer for a Proportionate Approach (2017);
- Institute of Public Health Ireland, Health Impact Assessment (2009);
- US Environmental Protection Agency, Health Impact Assessment Resource and Tool Compilation (September 2016);
- World Health Organisation (WHO), Environmental Noise Guidelines for the European Region (2018);
- WHO, Night-time Noise Guidelines for Europe (2009); and
- WHO, Global Air Quality Guidelines (2021).

7.2.3.1 EIA Directive

The 2014 amendment to the 2011 EIA Directive (2014/52/EU) directs that population and human health factors be assessed in an EIAR. The EIA Directive does not define the term 'human health', however the 2017 EC Guidance on the preparation of the EIAR states that *"human health is a very broad factor that would be highly project dependent. The notion of human health should be considered in the context of the other factors in Article 3(1) of the EIA Directive and thus environmentally related health issues (such as health effects caused by the release of toxic substances to the environment, health risks arising from major hazards associated with the Project, effects caused by changes in disease vectors caused by the Project, changes in living conditions, effects on vulnerable groups, exposure to traffic noise or air pollutants) are obvious aspects to study. In addition, these would concern the commissioning, operation and decommissioning of a Project in relation to workers on the Project and surrounding population".*

7.2.3.2 EPA EIAR Guidelines (2022)

The 2022 EPA EIAR Guidelines[2] published by the EPA state that *"while no specific guidance on the meaning of the term Human Health has been issued in the context of Directive 2014/52/EU, the same term was used in the SEA Directive (2001/42/EC). The Commission's SEA Implementation Guidance states 'The notion of human health should be considered in the context of the other issues mentioned in paragraph (f)'"*. Paragraph (f) of Annex I of the SEA Directive lists the environmental factors including soils, water, landscape, air etc.)[3].

The 2022 EPA EIAR Guidelines also state that the above health assessment approach is *"consistent with the approach set out in the 2002 EPA EIS Guidelines where health was considered through assessment of the environmental pathways through which it could be affected, such as air, water or soil"*. The 2022 EPA Guidelines state *"The evaluation of effects on these pathways is carried out by reference to accepted standards (usually international) of safety in dose, exposure or risk. These standards are in turn based upon medical and scientific investigation of the direct effects on health of the individual substance, effect or risk. This practice of reliance upon limits, doses and thresholds for environmental pathways, such as air, water or soil, provides robust and reliable health protectors* [protection criteria] *for analysis relating to the environment"*.

[2] https://www.epa.ie/publications/monitoring--assessment/assessment/guidelines-on-the-information-to-be-contained-in-environmental-impact-assessment.php

[3] Implementation of Directive 2001/42 on the assessment of the effects of certain plans and programmes on the Environment - https://ec.europa.eu/environment/archives/eia/pdf/030923_sea_guidance.pdf

The 2022 EPA EIAR Guidelines also note that in an EIAR, *"the assessment of impacts on population & human health should refer to the assessments of those factors under which human health effects might occur, as addressed elsewhere in the EIAR e.g. under the environmental factors of air, water, soil, etc."* and that *"assessment of other health & safety issues are carried out under other EU Directives, as relevant. These may include reports prepared under the Integrated Pollution Prevention and Control, Industrial Emissions, Waste Framework, Landfill, Strategic Environmental Assessment, Seveso III, Floods or Nuclear Safety Directives. In keeping with the requirement of the amended Directive, an EIAR should take account of the results of such assessments without duplicating them".*

7.2.3.3 IEMA Discussion Document (2017)

The Institute for Environmental Management and Assessment (IEMA) in the UK issued a discussion document in 2017 (IEMA, 2017) which it describes as a primer for discussion on what a proportionate assessment of the impacts on health should be in EIA. It is a useful document when considering what can and should be assessed in the context of EIA. Regard has been given to the general approach advocated in this document when compiling this chapter.

One of the messages in the IEMA document in terms of assessing health in EIA, is that there should be a greater emphasis on health outcomes (i.e., the potential effects on human health), rather than simply the health determinants (i.e., the agents or emissions which could have the potential to have health effects). This change in emphasis does not mean a complete change in practice.

The IEMA document notes that *"public health is defined as the science and art of promoting and protecting health and well-being, preventing ill-health and prolonging life through the organised efforts of society and has three domains of practice: health protection, health improvement and improving services"*. The IEMA document suggests that these three domains should be considered in the assessment of health in EIA. Examples of health protection issues to be considered could include issues such as chemicals, radiation, health hazards, emergency response and infectious diseases whilst health improvement issues could include lifestyles, inequalities, housing, community and employment. Examples of improving services issues could include service planning, equity and efficiencies.

The WHO defined health, in its broader sense, in its 1948 constitution as *"a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity"*. Therefore, whilst the Irish EPA EIAR Guidance is useful in terms of health protection, for a more holistic assessment, as per the IEMA document, it is also worthwhile to look at broader health effects in terms of opportunities for improvement of health and for improvement of access to services. While it is important to do this, it is also important not to attribute every conceivable event as being a health effect. To further rely on the WHO definition, a health effect would be something that would have a material impact on somebody's physical, mental and social well-being, be that positive or negative.

7.2.3.4 Health Impact Assessment and Environmental Impact Assessment

The 2017 IEMA Discussion Document notes that Health Impact Assessment (HIA) and EIA are separate processes and that whilst a HIA can inform EIA practice in relation to human health, a HIA alone will not necessarily meet the EIA human health requirement. HIA is not routinely carried out for major infrastructure schemes in Ireland.

Guidance on HIA was issued by the Institute of Public Health in Ireland (IPHI) in 2009 (IPHI, 2009). There are, however, considerable difficulties in performing a HIA as outlined by the IPHI

for infrastructural projects such as the proposed development. Not least of these is the difficulty of getting baseline health data. It is quite difficult due to patient confidentiality, and other reasons, to accurately determine levels of even relatively common medical conditions in a relatively defined population that might be affected by a proposed project. In the absence of an accurate baseline, it is very difficult to assess qualitative and quantitative changes that might occur. One could use more generalised data that might exist for larger areas such as a city or county, but these would be at most an estimate of the local baseline and not accurate enough to allow for meaningful interpretation.

The 2017 IEMA Discussion document also notes that the WHO provides an overview of health in different types of impact assessment (WHO, 2014) and presents the WHO perspective on the relationship of HIA to other types of impact assessment as follows:

"The health sector, by crafting and promoting HIA, can be regarded as contributing to fragmentation among impact assessments. Given the value of impact assessments from a societal perspective, this is a risk not to be taken lightly...The need...and justification for separate HIA cannot automatically be derived from the universally accepted significance of health; rather, it should be demonstrated whether and how HIA offers a comparative advantage in terms of societal benefits...Health issues can, and need to, be included [in impact assessment] *irrespective of levels of integration. At the same time, from a civic society perspective, it would be unacceptable for HIA to weaken other impact assessments. A prudent attitude suggests optimizing the coverage of health along all three avenues*:

- *better consideration of health in existing impact assessments other than HIA;*
- *dedicated HIA; and*
- *integrated forms of impact assessment."*

It is clear, therefore, that the WHO does not support a stand-alone HIA unless it could be demonstrated to be of advantage over an EIAR. It is for these reasons that this health assessment is part of the EIAR and there is no stand-alone HIA.

The HIA is defined as a combination of procedures, methods and tools that systematically judges the potential, and sometimes unintended, effects of a policy, plan, programme or project on both the health of a population and the distribution of those effects within the population, whilst the health assessment in the context of EIA focuses the attention of the assessment on likely significant effects, i.e. on effects that are deemed likely to occur and, if they were to occur, would be expected to be significant (as per the requirements of the EIA Directive). Conducting a HIA will not necessarily meet the EIA Directive population and human health assessment requirement.

7.2.3.5 Health Protection

The assessment of human health for the proposed development, in terms of health protection, follows the approach set out in the 2022 EPA EIAR Guidelines and in the EC's Guidance on the preparation of the EIAR. It is also similar in nature to the US Environmental Protection Agency (USEPA) Guidance, entitled *Health Impact Assessment Resource and Tool Compilation (*USEPA, 2016). Human health protection is considered through the assessment of the environmental factors (pathways) through which health could be affected such as air, noise, water and soils. The USEPA Guidance includes a four-step approach which is represented graphically below.

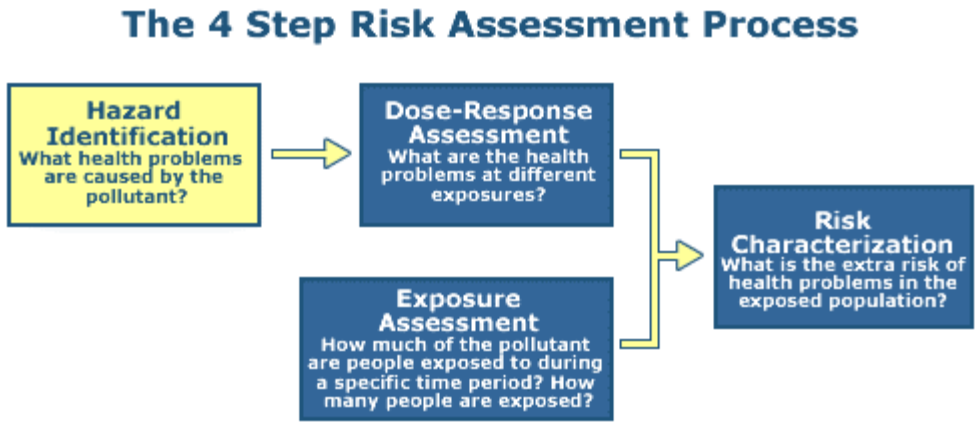


Figure 7-1: Four-step Risk Assessment Process (Source: USEPA, 2016)

This USEPA risk assessment process is similar to the Irish 2022 EPA EIAR Guidelines in that the potential noise, air, soils and water impacts which could affect human health are identified (Hazard Identification), the scale of these potential impacts (Dose-Response Assessment) and their duration (Exposure Assessment) are assessed and the significance of the potential impact on human health is determined (Risk Characterisation).

It should be noted that the identification of individual environmental hazards and the associated potential impacts and duration are undertaken in other chapters of this EIAR namely, Noise, Material Assets, and Air Quality and Climate. The associated significance in terms of the potential impact on human health is then considered in this chapter.

7.2.4 Consultation

A consultation letter on the proposed substation was sent to Fáilte Ireland on 8th December 2022. No response was received however this assessment has taken account of Fáilte Ireland's EIAR Guidelines for the Consideration of Tourism and Tourism Related Projects. The Fáilte Ireland Guidelines state that *"the character of an area from a tourism perspective should be described and the principal types of tourism in the area. Where relevant, the specific environmental resources or attributes in the existing environment which each group uses or values should be stated and where relevant, indicate the time, duration or seasonality of any of those activities".* The Guidelines also note that *"Where possible the value of the contribution of such tourism assets and activities to the local economy should be provided".*

7.3 EXISTING ENVIRONMENT

7.3.1 Population

7.3.1.1 Land Use

The site of the proposed substation is located in Profile Park, Dublin 22 which is c.3 km west of Clondalkin town centre.

Profile Park is a 100 acre (40.5 Ha) fully enclosed, private business park. Existing tenants within Profile Park and the surrounding business and enterprise parks include Google, Microsoft, Digital Realty Trust, Telecity and others. Immediately adjacent to Profile Park is the Castlebaggot 110 / 220 kV substation which provides electrical transmission connectivity to the national electricity transmission grid system.

The site of the proposed substation is greenfield. The northern boundary of the site is bounded by the internal road network within Profile Park, while the east, south, and west boundaries of the site are bordered by greenfield.

The existing Google PPK Data Centre Campus and Digital Realty Trust are located immediately to the south-west and south-east of the site respectively. The are no land use/activities on the existing site. The immediate area is predominantly commercial / industrial in nature. Outside of this, Grange Castle Golf Course is located c.250 m east of the site and Baldonnel Aerodrome c.500 m south of the site.

The nearest residential properties are located c.450 m to the south of the site and c.450 m to the north east.

The nearest primary schools to the proposed site include St. Ronan's School, Deansrath, Clondalkin, located c.1.4 km north-east, and Scoil Mochua (Primary School and Special Services) located c.1.3 km north-east. Other primary schools identified within the vicinity of the proposed substation site include:

- Talbot Senior National School, located c.2.3 km north-east;
- Nano Nagle Junior National School, located c.2.3 km north-east;
- Sacred Heart National School, located c.2.6 km east;
- St. John The Evangelist National School, Adamstown, located c.2.6 km north-west;
- Adamstown Castle Educate Together, located 2.6 km north-west;
- Esker Educate Together National School, Adamstown, located 2.6 km north-west;
- Lucan East Educate Together School, located c.2.6 km north;
- Griffeen Valley Educate Together National School, located c.3 km north;
- Lucan Community National School, located c.3.2 km north-east;
- Gaelscoil Chluain Dolcain, Clondalkin, located c. 2.9 km east.

The nearest secondary school identified within the vicinity is Deansrath Community College c.1.7 km north-east of the proposed substation site. Other secondary schools identified within the vicinity of the proposed substation site include:

- Adamstown Community College, located c.2.6 km north-west;
- Colaiste Chilliain, Clondalkin, located c.2.9 km east;
- Griffeen Community College, Lucan, located c.2.6 km north-east;
- Kishoge Community College, Lucan, located c.2.6 km north-east;
- Moyle Park College Clondalkin, located c.3 km east.

TU Tallaght (Technological University Dublin) campus is the nearest third level campus at 5.7 km south east of the site. Maynooth University Campus is located c.12.7 km north-west of the site, TU Blanchardstown is located c. 11km north-east, and a number of third level institutions are located c.12 km or further from the site in Dublin City Centre to the east, including Trinity College Dublin and TU Dublin Campuses (including Bolton Street and Grangegorman).

Public transportation available in the around the proposed site and the vicinity, and includes a Dublin Bus Route no. 68 and Nightlink Route no. 69N. The LUAS tram service (red line) serves the west Dublin area, with the nearest stop located to the south of the proposed site at City West (c.3.4 km south). The nearest Irish Rail line is situated c.2.5 km north of the site, serving Adamstown Station, c.2.8 km north-west, and Clondalkin-Fonthill Station, c.2.3 km north-east.

A number of community facilities and amenities are available in the vicinity and wider geographical area, including:

- Peamount Hospital (c.2.4 km west) , Cherry Orchard Hospital (c. 5.4 km north-east) and Tallaght University Hospital (c.5 km south-east);
- Deansrath Health Centre (c.1.5 km north-east), Nangor Medical Centre (c.2.1 km north-east), Clondalkin Medical Centre (c.2.4 km east), Primacare / Griffeen Medical Centre (c.2.9 km north), and Primacare / Citywest Medical and Dental Centre (c.3.8 km couth);
- Clondalkin Garda Station (c.3.4 km north-east), Rathcoole Garda Station (c.3.9 km south), and Tallaght Garda Station (c.5.9 km south-east);
- Tallaght Fire Station (c.4 km south-east);
- St. Ronan's Church (c. 1.5 km north-east), Sacred Heart Presbytery Church (c.2.5 km east); Church of the Transfiguration (Bawnogue) (c.2.3 km north-east), Immaculate Conception Church (c. 3 km east)and St .John's Church of Ireland (c. 3 km north-east);
- The Mill Centre (c.3.2 km north-east), Riverwalk Plaza (c.3.1 km south), and Citywest Shopping Centre (c.3.8 km south).

Further detailed description of the proposed project is provided in Chapter 3 (Description of the Proposed Development) of this EIAR.

7.3.1.2 Population Trends

An examination of the existing population in the study area has been carried out to identify population trends, density and to define the properties/receptors surrounding the proposed site.

Census data from the period 2006 – 2016 available from the CSO has been summarised in Table 7-1. The proposed substation would be located in the local authority area of South Dublin County Council (SDCC) and within the Electoral Division (ED) Clondalkin Village:

Table 7-1 Population Trends 2006-2016

Area	Population 2006	Population 2011	Population 2016	% Change from 2006 - 2016	Population 2022 (Preliminary)
State	4,239,848	4,588,252	4,761,865	+12%	5,123,536
Leinster	2,295,123	2,504,814	2,634,403	+15%	2,858,501
South Dublin	246,935	265,205	278,767	+12%	299,793
Clondalkin Village ED (03010)	8,718	8,492	9,152	+5%	9,430

During the period of 2006 to 2016, the population increased nationally by approximately 12% with the population of South Dublin County increasing by 12%. During this time, the population of Clondalkin Village ED increased by 5%, which represents an increase of 434 persons for the area. This illustrates that the population of the local area is increasing at a slower rate than rates at county, regional and national level.

Population density measures the number of persons occupying a geographical area in proportion to the size of that area. It is a useful indicator of settlement patterns in the area surrounding the proposed project and South Dublin County overall.

Table 7-2 Population Density 2016 Census

Area	Population Density 2016 (persons/km^2)
South Dublin County	1251.53
Clondalkin Village ED	57.56*

Table 7-2 shows population density (Census 2016) for the study area as well as SDCC and shows generally sparser population in the study area compared with the overall county.

Census 2022- Preliminary Results

The first publication by the Central Statistics Office (CSO) providing insights into Ireland's Census of Population and housing figures for 2022 was published in June 2022. This publication of the preliminary results is the first release in a series of results that will be published of the Census 2022. The main results will be published over several months, which the CSO states will begin from the end of May 2023.

The preliminary results indicate that the population of Ireland as of Census Night 2022 (Sunday 3rd of April 2022) was 5,123,536 persons; this population result is the first time in over 170 years (since 1841) that a census has recorded a population in Ireland of over 5 million people. The population increased by 361,671 persons (8%) since the previous census (April 2016), with an average annual population increase of 1.2% a year since 2016. The key findings of the preliminary results in terms of population growth are:

- Between 2016 and 2022 population growth occurred in every county;
- The population increase (361,671 persons) comprises a natural increase of 171,338 persons and an estimated net inward migration of 190,333 persons;
- Between 2016 and 2022 Ireland's housing stock increased by more than 120,000 units (6%) to over 2.1 million. This represents a marked increase compared to the intercensal period between 2011 and 2016 where housing stock increased by less than 1% (8,800);
- The number of occupied households increased by over 9% (150,000), while the number of vacant dwellings decreased by over 16,500 (-9%), from 183,312 in 2016 to 166,752 in 2022;
- In 2022, at a State level the census vacancy rate has decreased to less than 8%, down from over 9% in 2016, and 12% in 2011;
- The preliminary results indicate that the sex ratio has declined to the lowest level since 1871. A decline from 97.8 to 97.5 was experienced between 2016 and 2022.

The preliminary results for the 2022 Census indicate that the Dublin Region has seen a 7.7% increase in population since the previous 2016 Census.

In terms of statistics relating to local level, Electoral Divisions (EDs) are the most detailed administrative areas published for these preliminary census results. Of the 3,409 EDs in Ireland, 60 showed population increases of +30%, while a further 128 EDs showed increases between 20% and 30%. However, the population decreased in 17% of EDs (576) with 34 EDs recording decreases of over 10%, and 34 EDs (1% of EDs) had no change in population. The population for

the Clondalkin Village ED (03010), as of the 2022 Census preliminary results[4], stood at 9,430 people, an increase of 3% since 2016.

Table 7-3 Population Trends 2016 to 2022 (Preliminary Results)

Area	Population 2016	Population 2022 (Preliminary)	% Change from 2016 -2022
State	4,761,865	5,123,536	8%
Leinster	2,634,403	2,858,501	9%
South Dublin	278,767	299,793	8%
Clondalkin Village ED (03010)	9,152	9,430	3%

7.3.1.3 Property Receptors

The locations of properties and buildings (referred to as receptors) in the vicinity of the proposed substation have been identified using address data from the GeoDirectory database which is used to populate Eircodes. The validity of the GeoDirectory data has been confirmed by way of publicly available mapping, aerial imagery, and street-level imagery. All receptors within 1 km of the proposed site boundary have been identified and used to inform assessments within this EIAR.

Approximately 130 no. property receptors were identified within 1 km of the proposed substation location from the GeoDirectory database (January, 2023). The locations of these receptors in relation to the proposed substation are shown in Figure 7-2 below.

[4] https://www.cso.ie/en/releasesandpublications/ep/p-cpr/censusofpopulation2022-preliminaryresults/geographicchanges/#:~:text=Population%20growth%20across%20all%20counties,(%2B11%25%20in%20each).

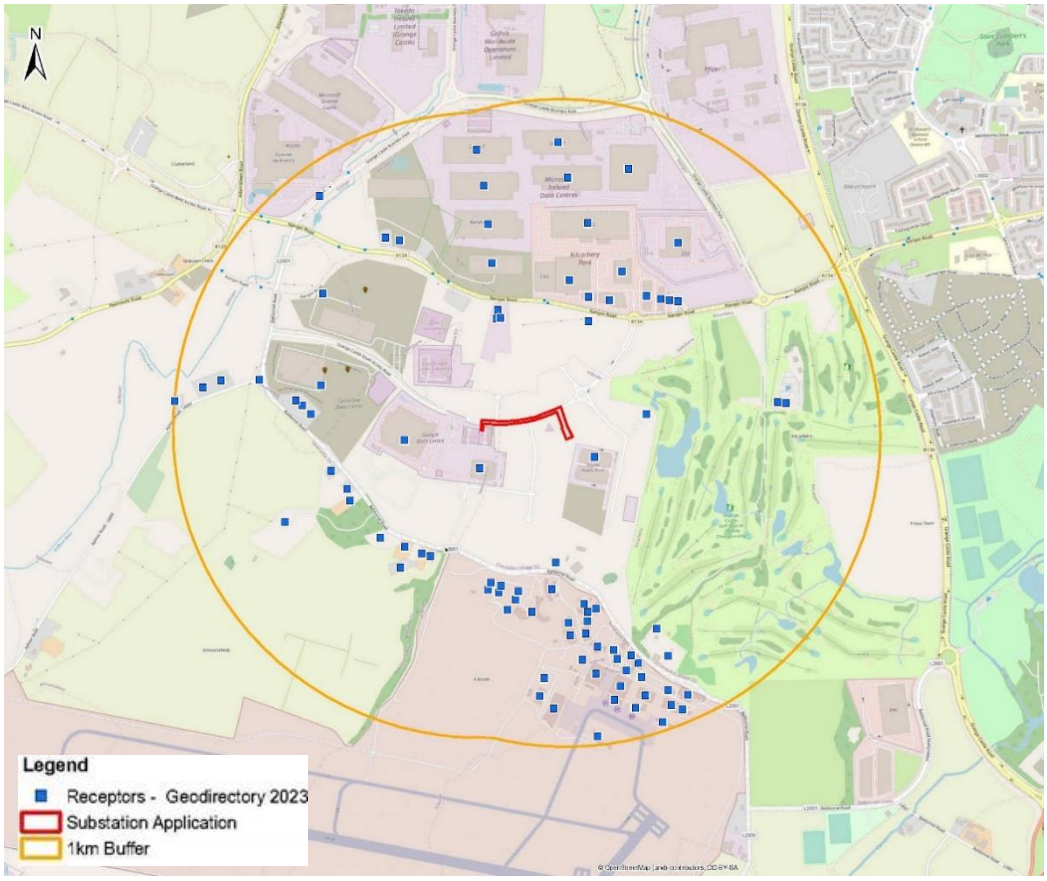


Figure 7-2: Property Receptors identified within 1 km of the proposed substation (GeoDirectory, 2023)

A review of this data using aerial photography indicates that the majority of these property receptors are present along the local road network to the north, south and west of the proposed substation location. To the south, the highest volume of properties are present along the sections of the Baldonnel Road (L2001) and Aylmer Road (L6003) which lie within the 1 km buffer. This includes a number of individual residential properties (a number with a commercial element), a creche, Baldonnel House & Orchard, and Kilbride House.

Approximately 30 of the identified sensitive property receptors present just off Baldonnel Road (L2001) are situated within Casement Aerodrome (Baldonnel). From a review of GeoDirectory data and aerial photography the properties appear to comprise a mix of buildings (accommodation and operations), infrastructure, and facilities associated with Defence Force and Garda operations at the Aerodrome. There is evidence of agricultural buildings/sheds in the lands along Baldonnel Road (L2001).

Table 7-4 Property Receptors within 1 km of the Proposed Substation

Property Receptor	Count
All	130
Non-Sensitive Receptors (Commercial / Industrial)	63
Sensitive Receptors (Dwellings / Aerodrome / Church / Golf Club)	67

Properties are present along Nangor Road (R134) to the north of the proposed substation, these are typically industrial and commercial in nature and include properties within Kilcarbery Park and the Microsoft Data Centres. A number of sensitive receptors are present along or off the Nangor Road (R134), including apartments, a number of individual residential properties (a number with a commercial element), and Grangecastle Golf Course and Kilcarberry House.

7.3.1.4 Property Values

Data available from the CSO on property values is presented in terms of Eircode Routing Key areas. The proposed site is located within Eircode Routing Key Area of Dublin 22.

In May 2023, the CSO published the Residential Property Price Index (RPPI) data for the 12-months to March 2023[5]. The latest RPPI data release shows that overall residential property prices rose by 3.9% nationally in the 12-months to March 2023, a change of -0.6%on the previous CSO RPPI release for February 2023. Overall, property prices in Dublin increased by 1.7%, with a 1.6% rise in terms of houses, and 2.1% for apartments. The highest house price growth in the Dublin region was in South Dublin (6.9%). Dublin City saw a decline of 1.2%.

Outside of Dublin, property prices outside increased by 5.7% on the same period a year earlier; house prices increased by 5.9% and apartment prices grew by 2.6%. Beyond the Dublin region, the greatest increase in house prices was in the Border region (Cavan, Donegal, Leitrim, Monaghan, Sligo) at 8.4%, compared to the Mid-West region (Clare, Limerick, Tipperary) which experienced a 2.8% increase.

Nationally, the lowest median price paid for a dwelling was in County Longford at €154,000, and the highest in Dún Laoghaire-Rathdown, County Dublin at €635,000. The RPPI currently shows that the national median price for a dwelling purchased in the 12-months to December 2022 was €310,000[6]. The CSO states the most expensive Eircode area over the 12-months to March 2023 according to the RPPI was A94 'Blackrock' (median price of €750,000), while F35 'Ballyhaunis' was the least expensive (median price of €126,000).

7.3.1.5 Employment and Economy

Employment is an important indicator of the economic situation of an area or region. This section examines employment status and unemployment levels in the region of the proposed substation. The Labour Force Survey undertaken by the CSO, in accordance with standard International Labour Organisation (ILO) criteria, and provides details of unemployment on a regional level. As the site is located in the Dublin Region (IE061 (EU NUTS3 Region))[7] data for this region is used to illustrate unemployment in the area. The findings from the Q1 2023 Labour Force Survey (latest available data) published by the CSO[8] are outlined in the following sections.

The first case of Covid-19 was reported in Ireland at the end of February 2020 and measures required in accordance with the public health guidance were introduced on 12 March 2020. As a result, the Labour Force Survey statistics from Q1 2020 to present (Q1 2023) are affected by the crisis. Therefore, over the past three years employment figures have fluctuated since the

[5]https://www.cso.ie/en/releasesandpublications/ep/p-rppi/residentialpropertypriceindexmarch2023/ (Accessed on 26 May 2023)
[6] https://visual.cso.ie/?body=entity/rppi (Accessed on 26 May 2023)
[7] https://ec.europa.eu/eurostat/web/nuts/nuts-maps - NUTS 3 – Nomenclature of Territorial Units for Statistics (NUTS) created by Eurostat.
[8] https://www.cso.ie/en/releasesandpublications/ep/p-lfs/labourforcesurveyquarter12023/ (Accessed on 26 May 2023)

beginning of the Pandemic due to public health measures including lockdowns and business closures.

Nationally, there were 2,608,500 persons (aged 15-89) in employment in Q1 2023, an increase of 102,700 or +4.1% over the year from Q1 2022 (2,505,800 persons), and an increase of 377,900 persons or +17% on the same period in 2021 (2,230,600 persons); this shows national employment is increasing as Ireland recovers after the Pandemic.

In the Dublin Region, there were 785,800 persons (aged 15-89) in employment in Q1 2023, an increase of 23,000 persons or +3% over the year from Q1 2022 (762,800 persons); this shows that there has been a marginal increase in the Dublin Region over the 2022-2023 period, in line with the national trend which has indicated an increase nationally.

The unemployment rate in Table 7-5 is the number of unemployed persons expressed as a percentage of the total labour force (aged 15-74). The unemployment rate for the State in Q1 2023 was 4.1%, while the unemployment rate for the Dublin Region (in Q1 2023) was 5.1%, marginally above (1%) that of the State.

Nationally, the number of persons aged 15-74 years who were unemployed decreased by 16,000 (-13%) to 110,700 in the year to Q4 2022. The unemployment rate for persons aged 15-74 years decreased from 4.8% to 4.1% over the year to Q1 2023.

Unemployment decreased nationally by 6,100 (-9%) for males to 62,700 in the year to Q1 2023 compared with a decrease of 10,000 (-17%) to 48,000 for females over the same period.

The unemployment rate for males was 4.4% in Q1 2023 down from 5.0% a year earlier while the corresponding rate for females was 3.8%, down from 4.7% in Q1 2022.

The unemployment rate (Persons aged 15-74) in the Dublin Region decreased from 5.8% to 5.1% over the year period from Q1 2022 to Q1 2023.

There were 2,719,100, persons aged 15-89 years in the labour force in Q1 2023. This represented an increase of 86,600 or 3% over the year from Q1 2022. In the Dublin Region, 827,600 persons aged 15-89 were in the labour force in Q1 2023; this is an increase of 18,300 persons on the same period in 2022.

The participation rate is the number of persons available to the labour force (i.e. persons from 15-74 years old either working or looking for work) expressed as a percentage of the total population. In Q1 2023, the participation rate in the State was 64.9% compared with 68.4% in the Dublin Region; this demonstrates that the participation rate in the Dublin Region is higher than the current trend nationally.

Table 7-5 Labour Force Survey (Q1 2023)

Location	Unemployment Rate	Participation Rate
State	4.1%	64.9%
Dublin Region (IE061)	5.1%	68.4%

The CSO also publishes figures relating to the Live Register. These figures are not strictly a measure of unemployment as they include persons who are legitimately working part-time and signing on part-time. However, the Register can be used to provide an overall trend within an

area. All counties saw an increase in the number of persons on the Live Register in the 12-months to April 2023; 44,595 persons were on the Live Register in the Dublin Region in April 2023. The figures in Table 7-6 show that over the 12-month period of April 2022 – April 2023, there was an 1.13% increase in the number of persons on the Live Register[9] in the State as a whole, and a 6.45% increase in the number of persons on the Live Register in the Dublin Region.

Table 7-6 Live Register Figures (April 2022 – April 2023)

Location	April 2022	April 2023	% Change
State	177,004	179,001	+1.13%
Dublin Region (IE061)	47,668	44,595	-6.45%

Chapter 9 of the SDCC Development Plan 2022-2028 sets out the Economic Development and Employment Policy Objectives for South Dublin to facilitate and support economic growth in an environmentally sustainable manner. Chapter 9 of the SDCC CDP sets out *"a broad spatial framework for enterprise and employment including the retail strategy for the County. Potential growth sectors are identified, and policies are included to encourage more labour-intensive sectors, promoting compact growth in appropriate locations, while recognising the need for a broad based, inclusive, and resilient economy within the County".*

The vision of the SDCC CDP in terms of economic development and employment is: *"The creation of a strong and resilient economic base providing expanded opportunities for employment and facilitating a good quality of life within vibrant and attractive places to live, work, visit and invest".*

Some of the overarching policy objectives identified in the SDCC Development Plan (2022-2028) in support of the above:

- Policy EDE1: *Overarching Support sustainable enterprise and employment growth in South Dublin County recognising the County's role in the Dublin region as a driver of economic growth.*
- EDE1 Objective 1: *To enable a strong, inclusive and resilient economy, supported by enterprise, innovation and skills through the creation of places that can foster enterprise and innovation and attract investment and talent, consistent with National Strategic Outcomes 4, 5 and 6 of the NPF.*
- EDE1 Objective 2: *To develop and support the Dublin Metropolitan Area Strategic Plan (MASP) through growth in the identified strategic development and employment areas of South Dublin County, as part of the growth of the Dublin Region to a sufficient scale and quality to compete internationally and to be drivers of national and regional growth, investment, and prosperity consistent with NSO 5 of the NPF.*
- EDE1 Objective 3: *To ensure that there is a sufficient supply of zoned and serviced lands at suitable locations to accommodate a range of enterprise and employment development types and to promote compact growth by strengthening the integration between employment, housing and transportation.*
- EDE1 Objective 4: *To support the implementation of the RSES Economic Strategy to create economic opportunity to diversify local and rural economies and create quality jobs, to achieve a sustainable, competitive, inclusive, and resilient region, through the promotion of:*
    - *Smart Specialisation for industry, enterprise agencies, Higher Institutes of Education, communities, and stakeholders;*

[9]https://www.cso.ie/en/releasesandpublications/ep/p-lr/liveregisterapril2023/ (Accessed 26 May 2023)

- *Clustering: Create, maintain, or upgrade economic strongholds in a favourable business ecosystem;*
- *Orderly Growth reflecting the identified strategic employment locations within the County;*
- *A broad, resilient, economic base.*

- EDE1 Objective 5: *To support the implementation of the Metropolitan Area Strategic Plan to support the objectives for the South - West Corridor and the area within the M50 by the:*
  - *Promotion of high tech, manufacturing and research and development in Grange Castle Business Park and Citywest;*
  - *Intensification of industrial lands and mixed-use development at the City Edge / City Edge Strategic Framework area and in Tallaght Town Centre / Cookstown while ensuring, to the greatest extent possible, the sustainability of existing businesses and employment.*
- EDE1 Objective 6: *To ensure that economic and enterprise related development is provided in a manner which facilitates a reduction in greenhouse gas emissions by supporting and promoting the following measures:*
  - *An increase in employment densities within walkable distances of communities and on public transport routes;*
  - *Promotion of walking and cycling and use of public transport through increased permeability and mobility management measures within and outside employment areas;*
  - *The sourcing of power from district heating and renewables including wind, hydro and solar;*
  - *Additional native tree planting and landscaping on existing and proposed enterprise zones and development sites to aid with carbon sequestration, contribute to the green infrastructure network of the County and promote quality placemaking.*
- EDE1 Objective 7: *To ensure a co-ordinated approach to policy and objectives contained within the County Development Plan and the Local Economic and Community Plan.*

The SDCC CDP 2022-2028 recognises that policies and objectives of the Development Plan must be consistent with national and regional planning policy as set out in the National Planning Framework (2018) (NPF) and the Regional Spatial and Economic Strategy (2019) (RSES). The NPF National Strategic Outcome 5 seeks *"a strong economy for the country supported by enterprise, innovation, and skills"*. The SDCC CDP recognises that this depends on creating places that can encourage enterprise and innovation, as well as attract investment and talent.

7.3.1.6 Tourism

The area surrounding the proposed site is characterised by industrial land uses and activity. Tourism therefore is not present within the immediate vicinity of the site. Notwithstanding this, it is helpful to understand the site within a national, regional and county wide context.

National Tourism Development Authority (Fáilte Ireland) periodically collates statistics on overseas visitors to Ireland and regions within the country. Table 7-7 shows the most recent

overseas tourism statistics from 2018[10] and 2019[11] for the country and the Dublin region, which includes SDCC.

Table 7-7 Overseas Tourism Statistics (2018 & 2019)

Location Travelled To	Tourist No.s	Revenue Generated
Ireland (2019)	9.7 million	€5.17 billion
Dublin Region (2019)	6.6 million	€2.21 billion
Ireland (2018)	9.6 million	€5.21 billion
Dublin Region (2018)	6.3 million	€2.09 billion

Fáilte Ireland statistics show that County Dublin (of which SDCC is part of) attracted 6,309,000 overseas visitors, with associated revenue generation of €2.09 billion, in 2018, and 6,644,000 overseas visitors, with associated revenue generation of €2.21 billion, in 2019.

In relation to domestic tourism (tourism involving residents of one country traveling only within that country), the Fáilte Ireland 2018 data reports 10.9 million domestic trips in 2018 (+13% on 2017 trips), and 11.6 million domestic trips in 2019 (+6.4% on 2018 trips). Typically, the majority of these domestic trips were recorded as short (1-3 days) holiday trips, with trips to visit friends/relatives reported highest as the purpose of travel for all domestic trips. Most of these trips are shown to occur in the late summer period (July-September) with the majority of domestic holidaymakers engaging in hiking/walking. Fáilte Ireland statistics show that County Dublin supported 1,700,000 and 1,763,000 domestic trips in 2018 and 2019 respectively.

To enhance visitor experiences across the whole of county Dublin, Fáilte Ireland has launched a tourism initiative and website called Visit Dublin[12] to provide comprehensive information on attractions and events across the area.

SDCC seek to support and facilitate the development of the County's tourism and leisure sector. The county enjoys a variety of natural, cultural and built heritage resources with the South Dublin Tourism Strategy 2015[13] identifying a range of actions to develop tourist products. Furthermore, Destination Dublin, A Collective Strategy for Tourist Growth to 2020 was developed to aid development of the tourist product. Some of the attractions within the vicinity of the proposed site are:

- Grange Castle Golf Course is the closest tourist attraction to the proposed substation; Located approximately c.221 m south east of the site, the course is owned by SDCC;
- Corkagh Park is located c.1.28 km south east of the proposed site, it encompasses c.120 hectares and originally formed part of a manor house and estate;
- Camac Valley Tourist: Caravan & Camping Park is located c.1.7 km south east of the proposed site, within the Corkagh Park demesne;
- Clondalkin Round Tower is located c.3.23 km north east of the proposed substation. The tower, built on the site of a monastery, dates back to the 7th century and is one of only four remaining round towers in Dublin;

[10] Key Tourism Facts 2018 Failte Ireland Research (December, 2019) available at: https://www.failteireland.ie/FailteIreland/media/WebsiteStructure/Documents/3_Research_Insights/Key-Tourism-Facts-2018.pdf?ext=.pdf
[11] Key Tourism Facts 2019 Failte Ireland Research (March, 2021) available at: https://www.failteireland.ie/FailteIreland/media/WebsiteStructure/Documents/3_Research_Insights/4_Visitor_Insights/KeyTourismFacts_2019.pdf?ext=.pdf
[12] https://www.visitdublin.com/
[13] https://www.sdcc.ie/en/services/sport-and-recreation/tourism/south-dublin-tourism-strategy/

- The leading attraction in the vicinity of the proposed substation is the Dublin Mountains Park, which is located c.5.24 km to the south. This area provides high quality recreation amenity and experience for both domestic and overseas visitors.

The SDCC CDP 2022-2028 (Section 9.9) sets out policy and objectives related to Tourism and Leisure including:

- Policy EDE19 regarding Tourism Infrastructure: *Support the development of a sustainable tourism industry that recognises the recreational and tourism potential of the County, building on the actions in the South Dublin County Tourism Strategy, 2015 or any superseding strategy.*
    - EDE19 Objective 1: *To support the development of tourism infrastructure, attractions, activities, accommodation and facilities at appropriate locations subject to sensitive design and demonstrated environmental safeguards.*
    - EDE19 Objective 2: *To primarily direct tourist facilities into established centres, in particular town and village centres, where they can contribute to the wider economic vitality of urban centres.*
    - EDE19 Objective 5: *To continue to engage and collaborate with tourism stakeholders including Fáilte Ireland to deliver on the Tourism objectives for the County.*

7.3.2 Human Health

Evidence shows that different communities have varying susceptibilities to health effects both positive and negative as a result of social and demographic structure, behaviour and relative economic circumstance. Whilst specific health data for individuals in the vicinity of the proposed substation is confidential and difficult to establish, a community profile has been identified to establish the baseline health profile of the area and compare this profile to the rest of the country.

CSO Irish Health Survey 2020

In 2020, the Central Statistics Office (CSO) published its second "Irish Health Survey"[14], the data for which was collected in 2019 and early 2020. The first survey was collected for reference year 2015. This publication is part of an EU wide health survey and as other EU countries report on their data, it will be possible to compare how the Irish health experience compares to that of our EU neighbours. Some key findings of the survey included:

- *"Affluent people are more likely to feel their health status is Very good or good than people who are disadvantaged - 92% of Very affluent persons compared to 78% of persons who are Very disadvantaged;*
- *Over a quarter of persons aged 15 years and over report having a long lasting condition, with older persons reporting higher levels;*
- *Majority of persons (82%) report no limitations in everyday activities due to a health problem;*
- *Over a fifth (21%) of Unemployed persons report some form of mental ill-health compared to 9% of those in employment;*
- *Prevalence of hospital in-patient admissions rises with age and disadvantage level;*
- *In general, females and older people more likely to use a preventive health service;*

[14] https://www.cso.ie/en/releasesandpublications/ep/p-ihsmr/irishhealthsurvey2019-mainresults/introductionandkeyfindings/

- *Physical activity declines with age and relative disadvantage level;*
- *Younger persons more likely to drink 6 or more units of alcohol in one sitting; and*
- *Over half of persons aged 15 years and over in the State are overweight or obese" (CSO 2020).*

The Census 2016[15] responses regarding general health[16] found that 87% of the Ireland's population felt they had 'Very Good' or 'Good' health, down slightly from 2011 when it was 88.3%. Nearly six in ten or 59.5% of men felt their health was 'Very Good', compared with 59.3% of women. The census results also clearly show the decline in general health with age, with 79% of 15-19 year olds in 'Very Good' health, compared with those aged 40-44 (58.6%) and 65 to 69 (31.3%). Census 2016 responses for Longford indicated the percentage of persons with 'Very Good' and 'Good' health was 85.3% (17,577 Males / 17,278 Females), while 9.7% indicated they were in 'Fair' health (1,983 Males / 2,002 Females), and 2.1% (399 Males / 440 Females) indicated they were in 'Bad' to 'Very Bad' health; 2.9% of respondents did not state the status of their general health. The 2016 census also indicated that there are 5,916 (2,922 Males / 2,994 Females) with disabilities living in Longford, and that there are 1,760 (747 Males / 1,013 Females) carers in the County.

Healthy Ireland Survey 2022

In December 2022, the Government released it's Healthy Ireland Survey Summary Report[17]. This is an interviewer-administered survey, commissioned by the Department of Health and carried out by Ipsos, of the health and health behaviours of people living in Ireland. The Survey has been undertaken since 2015, however, due to the COVID-19 pandemic it was not possible to complete the 2020 survey. The Survey is a key component of the 'Healthy Ireland Framework' and informs the Healthy Ireland Strategic Action Plan, by contributing to the research, monitoring and evaluation required to assess the impact of policy implementation. Approximately 7,500 individuals representative of the population aged 15 and older are surveyed. The Survey covers a variety of health-related topics, including; general health, alcohol, smoking, weight, dental, female health, skin protection, and mental health.

In terms of General Health, respondents were asked to rate their health on a 5-point scale from 'very good' to 'very bad'. Overall, 82% of respondents perceived their health as 'good' or 'very good', which is a 2-point decline since 2021. 83% of men and 81% of women rated their health as 'good' or 'very good'. Overall, 3% of respondents perceived their health as 'bad' or 'very bad'. General 'good' health decreases with age, with 92% of 15–24-year-olds rating their health as 'good' or 'very good', in contrast to 64% of respondents aged 65 and older. The Survey notes that those with Leaving Certificate education or higher are considerably more likely to report themselves as being in good health than those who did not attain a Leaving Certificate (87% and 69% respectively). Employment status is also stated as indicative of self-reported health, with those who are employed (90%) or students (91%) significantly more likely to report good health than those who are unemployed (76%).

With regard to the occurrence of health conditions, the Survey results indicate that 31% have a long-standing illness or health problem, lasting at least 6 months or longer; females are more likely than males to report long-standing health conditions (34% and 28% respectively); and respondents aged 65 and older (53%) are considerably more likely to report a long-standing illness or health problem than those aged under 45 (18%). Furthermore, based on a list of 25 of the most common conditions, respondents were asked to report whether they had been

[15] https://www.cso.ie/en/csolatestnews/presspages/2017/census2016profile9-healthdisabilityandcarers/
[16] https://www.cso.ie/en/statistics/health/
[17] https://www.gov.ie/en/publication/f9e67-healthy-ireland-survey-2022/

medically diagnosed with a long-term illness. Of the responses, high blood pressure (7%), diabetes (5%), arthritis (5%), asthma (4%), psychiatric diagnoses (such as anxiety or depression) (3%), and high cholesterol (3%) were the most common conditions reported by respondents.

South Dublin County Council Area Health Profile

A group made up of the Health Services Executive (HSE) and the Irish Health Repository (IHP), known as Lenus, have published separate health profiles for all the Local Authorities areas in Ireland. The most recent County Health Profiles published are from 2015[18] (Lenus, 2015) and have been used to establish a community health profile for SDCC in which the proposed substation is situated.

The key facts in the 2015 Health Profile relating to SDCC are:

- The proportion of the population for the area are aged over 65 years is 8.7%, which is considered low when compared with the national rate of 11.7%;
- The South Dublin area has the highest rate of lone parent households (2.9% higher than the national rate) and an above average number of households which are local authority rented;
- Average birth rate for the South Dublin area is 18.8%, which is above average when compared to the national rate of 15.8 %;
- Cancer incidence rates for certain cancers (male colorectal cancer, female malignant melanoma, and male and female lung cancers) are above the national average;
- Mortality rates are also above the national average for heart disease and stroke in those aged under 65 years.

It is important to note when viewing these figures that they relate to the entire administrative area of SDCC and a population of 265,205 in the 2011 Census. While the published data can be taken as being correct, it may not necessarily accurately reflect the health profile of smaller areas which are within the study area and close to the proposed substation.

The map of deprivation included in the County Health Profile shows that SDCC experiences higher levels of Disadvantage when compared with levels of the nation overall as shown in Figure 7-3 below.

[18] https://www.hse.ie/eng/services/list/5/publichealth/publichealthdepts/pub/profiles.html (Accessed 14 March 2023)

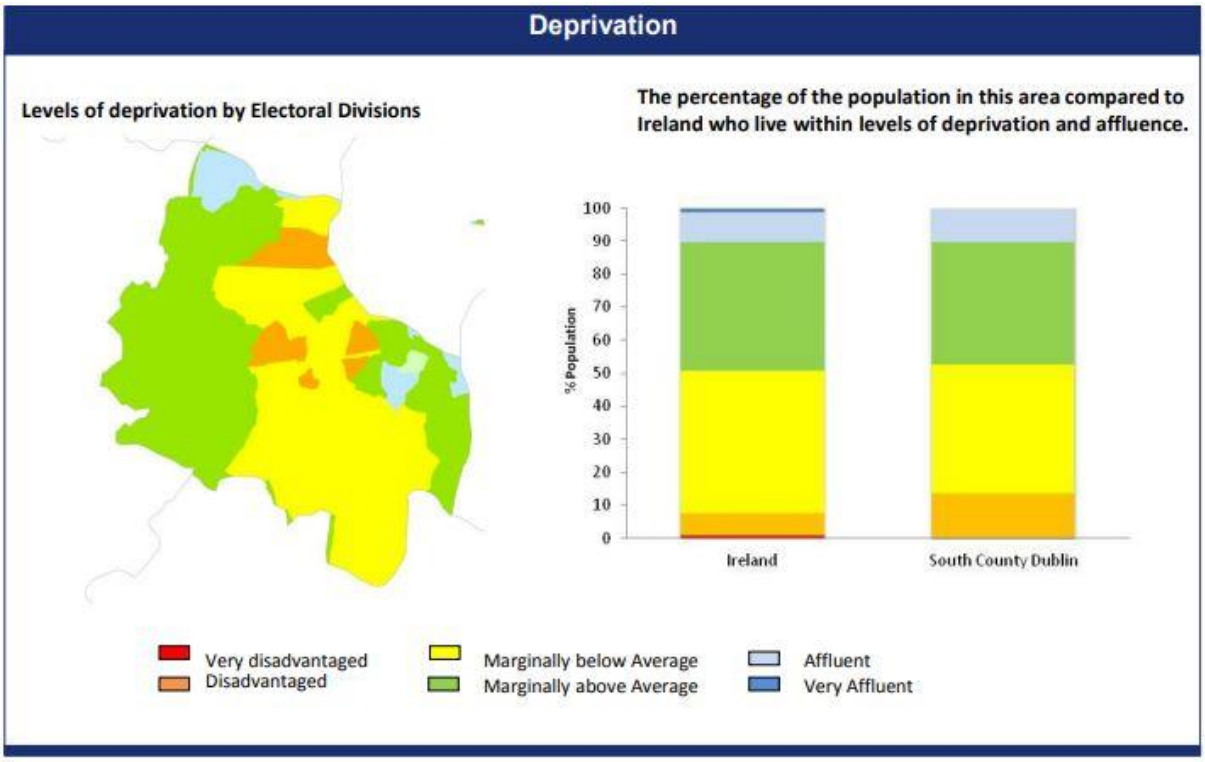


Figure 7-3 - Map indicating Deprivation Levels in South County Dublin (HSE 2015 Health Profile for South Dublin)

Pobal[19] the organisation for administering and managing Government and EU funding to address disadvantage and support social inclusion provides a Deprivation Indices for Ireland, which can be accessed and viewed online[20], with data available regarding deprivation levels at small area statistics and electoral division levels. According to the Pobal Deprivation Index for the ED of Clondalkin Village deprivation is 'marginally above average' based on 2016 CSO data.

As outlined previously, it is not possible or necessary to identify every vulnerable individual. However, every human community contains vulnerable individuals; be those the old, the very young or because they have conditions which may make them more susceptible. Examples are diverse and can include asthma, autism, and those with psychological illness. It is important to note that Health Standards are set for the vulnerable and not for the robust.

The emergence of the Covid-19 virus in Ireland in the early part of 2020 has presented a new human health risk and concern amongst the general public across the country and within the proposed substation study area. The medium to long term effects of the virus on national and local human health is not currently known. In May 2023, the WHO announced that it had determined that COVID-19 is now an established and ongoing health issue which no longer constitutes a public health emergency of international concern (PHEIC)[21].

[19] Pobal administers and manages Government and EU funding to address disadvantage and support social inclusion / Pobal works on behalf of Government to support communities and local agencies toward achieving social inclusion and development - https://www.pobal.ie/

[20] Pobal Deprivation Indices web viewer - https://maps.pobal.ie/WebApps/DeprivationIndices/index.html

[21] Statement on the fifteenth meeting of the IHR (2005) Emergency Committee on the COVID-19 pandemic - https://www.who.int/news/item/05-05-2023-statement-on-the-fifteenth-meeting-of-the-international-health-regulations-(2005)-emergency-committee-regarding-the-coronavirus-disease-(covid-19)-pandemic (Accessed 26 May 2023)

7.4 ASSESSMENT OF SIGNIFICANT EFFECTS ON POPULATION

7.4.1 Do Nothing Effects

Under a Do-Nothing Scenario, the existing lands would remain unchanged as a greenfield site. As such there would be no emissions generated from the construction or operation of the proposed substation or potential effect associated with noise, vibration, air, visual or traffic. The opportunities for local employment and additional economical spend from the construction and operation of the proposed substation would not be realised.

7.4.2 Construction Phase

7.4.2.1 Land Use

As set out Section 3.4.1, Chapter 3, of the EIAR, it is expected that construction will commence in 2023 with design, construction, and commissioning activities lasting for approximately 12 months. The proposed Baldonnell 100kV substation is expected to become fully operational, along with the gas fired power plant , which is currently expected to be operational in 2024, subject to timely receipt of the necessary statutory consents.

The total number of construction staff on-site will vary during the construction phase of the works but are expected to peak at approximately 20 persons per day.

7.4.2.2 Population Trends

It is anticipated that there would be a positive direct effect on local population trends as a result of the construction of the proposed substation. Employment generation is considered to involve 20 persons during peak activities on site and this short-term increase in employment may also result in a short-term increased need for accommodation locally. This short-term positive effect will add value to the local economy. Otherwise, the construction of the proposed substation would not result in any permanent change to local population trends within the area or across SDCC. There will be a short-term and imperceptible effect on population.

7.4.2.3 Property Receptors

Access to the proposed substation site will be provided via the adjacent gas fired power plant site. The adjacent gas fired power plant site is accessed via an entrance off the existing industrial estate roadway, with access to the Profile Park industrial estate provided north of the site via the R134 (New Nangor Road).

The potential traffic effects are discussed in detail in Chapter 15 (Traffic and Transportation) of this EIAR.

Negative effects on the local population as well as residential properties as a result of construction work, including construction related traffic movements, could impact on noise and air quality. In addition, there is potential for works to impact local residential amenity, i.e., a resident's enjoyment of their home.

The delivery of construction equipment and materials is proposed via existing public roads, which are currently used by heavy goods vehicles (HGV)s. As a result, there will be a short-term increase in traffic related effects during the construction phase. These effects are assessed in detail in the Chapter 10 (Air Quality and Climate) and Chapter 11 (Noise and Vibration) of this EIAR.

It is considered that any negative effects arising during construction will be slight and short term in nature. In addition, it should be noted that properties located along the R134 (New Nangor Road), which will experience an increase in construction traffic movements are located at a distance from the proposed substation site, with the nearest residential dwellings in the area surrounding the proposed development located c.400 m or further from the site.

7.4.2.4 Property Value

The construction works for the proposed substation will not have any impact on the local property values. Profile Park and its surrounding business parks are zoned for 'Employment and Industry' and there is significant construction being undertaken in this area with no evidence of a reduction in house prices arising from this construction activity. The effect on property value will be neutral.

7.4.2.5 Employment/Economy

The proposed substation will lead to the support and creation of direct and indirect employment during construction. At a local level, employment will rise due to the staff required on site. At a regional and national level, employment will be created through specialised construction services as well as through the supply of building equipment and materials. It is anticipated that the proposed substation will have the following effects locally:

- Increased generation of development activities such as site monitoring/surveys, site investigations, legal fees, consultancy studies during pre-construction and construction works, etc.;
- Increased spending locally by construction employees; and
- Increased demand for local accommodation and sustenance will be required for workers on site.

As a result, the construction phase of the proposed substation will have a short-term, slight positive effect on employment and economy in the local area.

7.4.2.6 Tourism

There are a number of tourism attractions and public amenities within the study area including the Grange Castle Golf Course, Corkage Park, Clondalkin Round Tower, and the Dublin Mountains Park. Due to its location and distance from tourist amenities, is not considered that construction work for the proposed substation will have any direct or negative impact on tourist amenities. Furthermore, there are no negative effects arising from construction for local recreational users is anticipated.

Overall, effects are predicted to be neutral. Potential effects on receptors with regards to air quality, noise and vibration, traffic, and landscape and visual appearance are assessed in their respective chapters of this EIAR.

7.4.3 Operational Phase

7.4.3.1 Land Use

The site of the proposed substation will change from a greenfield site zoned for 'Enterprise and Employment' development to a substation. This will result in a long-term and significant effect on land use which is consistent with the land use zoning of the site and its environs.

7.4.3.2 Population Trends

The substation will be unmanned, with routine maintenance and security services being carried out intermittently over its operational lifetime. It is not anticipated that the operation of the proposed substation will have any direct or negative impact on population trends. Effects are predicted to be neutral.

7.4.3.3 Property Receptors

It is not anticipated that the proposed substation whilst in operation will have any significant or long-term effect on sensitive local receptors (dwellings) within the area. As set out in section 7.4.2.3, the nearest residential dwellings are located over c.400 m or further from the proposed substation site. Potential effects on receptors with regards to air quality, noise and vibration, traffic, and landscape and visual appearance are assessed in their respective chapters of this EIAR.

7.4.3.4 Property Values

The proposed substation is not predicted to have any impact on the local property values. Profile Park and its surrounding business parks are zoned for 'Employment and Industry' and there is significant development of a similar nature, commercial and industrial infrastructure, in this area with no evidence of a reduction in house prices. The effect on property value will be neutral.

7.4.3.5 Employment /Economy

The substation will be unmanned, with routine maintenance and security services being carried out intermittently over its operational lifetime.

There will be a neutral direct effect on employment, however, the indirect effects of the substation may include facilitating additional data centre development. In the event that this was to occur this would result in employment and other commercial opportunities which would have a slight to moderate indirect positive effect.

7.4.3.6 Tourism

The Fáilte Ireland Guidelines state that *"The impact upon tourism can be considered within this section through the sensitivities of hospitality, safety and pace of life. Changes in population can impact the perception of pace of life or safety in a particular location"*. The Guidelines also note that *"Impacts upon these issues in areas which rely heavily on tourism or have a particular sensitive tourism generator should be considered in this section"*.

As noted previously, there are a number of relevant tourism attractions and public amenities within the study area including the Dublin Mountains Park, as well as the adjacent Grange Castle Golf Course and Corkagh Park. It is not anticipated that the operation of the proposed substation will have any direct or negative impact on tourist amenities or local recreational amenities. Effects are predicted to be neutral.

7.4.4 Decommissioning Phase

The proposed Baldonnell 110kV substation is expected to be operational in accordance with the adjacent gas fired power plant. The power plant is expected to be operational for at least 25 years. On cessation of activities, the plant will either be redeveloped as a power related facility or the site will be redeveloped in an alternative form.

In the event that the substation is decommissioned, the following programme will be implemented:

- All plant equipment and machinery will be emptied, dismantled, and stored under appropriate conditions until it can be sold. If a buyer cannot be found, the material will be recycled or disposed of through licensed waste contractors and hauliers. If plant and machinery is required to be cleaned on site prior to removal, all necessary measures will be implemented to prevent the release of contaminants;
- All waste will be removed from the facility; and
- The site and all associated buildings will be secured.
- Waste will be recycled wherever possible. All waste movement, recycling, and disposal operations will be controlled by licensed waste contractors.

Details of provisions to decommission and render safe or remove all materials, waste, ground, plant, or equipment contained on or in the site that may result in environmental pollution will be agreed with the Environmental Protection Agency as part of the Industrial Emissions Licensing process.

7.5 ASSESSMENT OF SIGNIFICANT EFFECTS ON HUMAN HEALTH

The following sections provide a summary of some of the available material in relation to potential effects of the proposed substation on human health.

7.5.1 Do Nothing Effects

Under a Do-Nothing Scenario, the existing lands would remain unchanged as a greenfield site. The health benefits to the country associated with proposed substation supporting the peaking power plant in the replacing fossil fuels with sustainable forms of energy development would be lost.

7.5.2 Construction Phase

7.5.2.1 Air Quality and Dust Emissions

The greatest potential effect on air quality during the construction phase of the proposed substation is from construction dust emissions as a result of excavation works, infilling and landscaping activities and storage of soil in stockpiles. This leads to the potential for nuisance dust. While construction dust tends to be deposited within 350 m of a construction site, the majority of the deposition occurs within the first 50 m (IAQM, 2014)[22]. The extent of any dust generation depends on the nature of the dust (soils, sands, gravels, silts etc.) and the nature of the construction activity. In addition, the potential for dust dispersion and deposition depends on local meteorological factors such as rainfall, wind speed and wind direction.

The construction of the proposed substation will take place away from residential properties (receptors) with the nearest receptor located over c.400 m from the site. As set out in Chapter 10 (Air Quality and Climate), dust and particulate matter effects from the site will be imperceptible, direct, neutral, and short-term in nature, and therefore is predicted to pose no nuisance to nearby sensitive receptors.

[22] IAQM Guidance on the Assessment of Dust from Demolition and Construction Version 1.1 (2014) - https://iaqm.co.uk/text/guidance/construction-dust-2014.pdf

7.5.2.2 Noise and Vibration

During the construction phase of the proposed substation there will be some effect on nearby noise sensitive properties due to noise emissions from typical construction activities. However, given the scale of the proposed development, the distances between the main construction works and nearby noise sensitive properties, and that the construction phase of the proposed substation is temporary in nature, it is expected that the various noise sources will not be excessively intrusive.

As set out in Chapter 11 (Noise and Vibration), in the majority of cases, construction noise effect will not be significant; in a small number of cases, a slight effect is predicted. Furthermore, due to the distance of the proposed works from sensitive locations significant vibration effects are not expected, and construction vehicle movements are not expected as a significant source of vibration along the existing road networks.

Appropriate noise and vibration control measures will be implemented, and will ensure that noise and vibration effect is kept to a minimum. Noise effects are predicted to be slight and short term. Vibration effects are predicted to be not significant and momentary.

7.5.2.3 Health and Safety

All activities carried out by the appointed Contractor on the proposed substation will be in accordance with the requirements of the Safety, Health and Welfare at Work Act 2005 as amended and Regulations made under this Act.

The CEMP sets out the Health and Safety requirements for the project including the erection of fencing, signage and notification of commencement of works to the Health and Safety Authority (HSA).

7.5.3 Operational Phase

7.5.3.1 Air Quality

As set out in Chapter 10 (Air Quality and Climate), emissions from the site will not result in a significant effect on human health. It can be concluded that dust and particulate matter effects from the site will be long-term, direct, neutral and imperceptible in nature, and therefore is predicted to pose no nuisance to nearby sensitive receptors.

7.5.3.2 Noise and Vibration

With respect to the operational phase of the proposal, the predicted noise and vibration levels are expected to be within best practice noise limits. As set out in Chapter 11 (Noise and Vibration), review of the predicted increases in noise level at the nearest residential noise sensitive locations conclude that the associated effect is 'not significant' at all locations for daytime, evening and night time periods. Therefore, in relation to noise, the associated effect is predicted to be not significant and long-term.

There are no expected sources of vibration associated with the operational phase of the proposed development. In relation to vibration the associated effect is predicted to be imperceptible and long-term.

7.5.3.3 Health Benefits

Aside from the potential socio-economic benefits previously discussed, there are environmental benefits to the proposed substation. The current and historical practice of fossil fuel combustion with the associated release of a range of pollutants including particulate matter, oxides of nitrogen, sulphur dioxide, carbon dioxide and many others is well documented. The release of these pollutants from the power generation sector is also a major contributor to global warming and the resulting changing effects on our climate.

The phasing out of coal, gas and peat burning substations in Ireland is a key step in achieving Ireland's 2030 decarbonisation ambition as set out in the Climate Action Plan 2023 and the placement of fossil fuels in electricity generation by clean renewable wind energy will have significant benefits for air quality and slowing down global warming.

The contribution of the proposed substation, in supporting the Profile Park Power Plant to achieve a decrease in reliance on fossil fuel combustion will have a moderate to significant positive long-term effect on the health and well-being of the general population.

7.5.3.4 Residential Amenity

Residential amenity relates to the human experience of a person's home, derived from the general environment and atmosphere associated with the residence. The quality of residential amenity is influenced by a combination of factors, including site setting and local character, land-use activities in the area and the relative degree of peace and tranquillity experienced at the residence. The nearest dwellings to the proposed substation are located approximately 400 m or further from the site.

Access to the proposed substation site will be provided via the adjacent gas fired power plant site. The adjacent gas fired power plant site is accessed via an entrance off the existing industrial estate roadway, with access to Profile Park provided north of the site via the R134 (New Nangor Road), and therefore these properties will be unaffected by the proposed substation. There will therefore be a neutral effect on amenity.

As noted previously, there are no anticipated negative effects on residential amenity arising from the operation of the proposed substation. Further detail on the assessment of air quality, noise, vibration, and traffic are set in their respective chapters of this EIAR.

7.5.4 Decommissioning Phase

As set out in Section 7.4.4, the proposed substation is expected to be operational for at least 25 years. On cessation of activities, the substation will either be redeveloped / upgraded and continue in its current use as a substation, or the site will be redeveloped in an alternative form.

In the event that the substation is decommissioned, the following programme will be implemented:

- All plant equipment and machinery will be emptied, dismantled, and stored under appropriate conditions until it can be sold. If a buyer cannot be found, the material will be recycled or disposed of through licensed waste contractors and hauliers. If plant and machinery is required to be cleaned on site prior to removal, all necessary measures will be implemented to prevent the release of contaminants;
- All waste will be removed from the facility; and
- The site and all associated buildings will be secured.

- Waste will be recycled wherever possible. All waste movement, recycling, and disposal operations will be controlled by licensed waste contractors.

Details of provisions to decommission and render safe or remove all materials, waste, ground, plant, or equipment contained on or in the site that may result in environmental pollution will be agreed Environmental protection Agency as part of the Industrial Emissions Licensing process.

7.6 MITIGATION AND MONITORING MEASURES

7.6.1 Construction Phase

No specific mitigation or monitoring measures are proposed for the construction phase in terms of population and human health outside of those specified in the respective technical chapters of this EIAR as referenced in Section 7.1.

7.6.2 Operational Phase

No specific mitigation or monitoring measures are proposed for the operational phase in terms of population and human health outside of those specified in the respective technical chapters of this EIAR as referenced in Section 7.1.

7.6.3 Decommissioning Phase

It is envisaged that the proposed substation will be operational for at least 25 years and on cessation of activities, the plant will either be redeveloped / upgraded and continue in its current use as a substation, or the site will be redeveloped in an alternative form. In the event where the substation is decommissioned, details of provisions to decommission and render safe or remove all materials, waste, ground, plant, or equipment contained on or in the site that may result in environmental pollution will be agreed and undertaken as required by the relevant planning conditions.

No specific mitigation or monitoring measures related to decommissioning are proposed in terms of population and human health outside of those specified in the respective technical chapters of this EIAR as referenced in Section 7.1.

7.7 CUMULATIVE EFFECTS

In the assessment of cumulative effects, any other existing, permitted or proposed developments in the surrounding area have been considered where they have the potential to generate in-combination or cumulative effects with the proposed substation. The potential for cumulative effects on the local population and human health, in particular with regard to noise, vibration, air, traffic and visual effects are discussed in the relevant chapters as identified in Section 7.1.

7.8 RESIDUAL EFFECTS

7.8.1 Construction Phase

The proposed substation will have a slight positive residual impact on the local economy through construction worker spending.

7.8.2 Operational Phase

The proposed substation will provide a connection to the existing electricity transmission network for the adjacent peaking power plant, supporting the power plant in the balancing of the grid to enable greater renewable development on a national scale and help to achieve targets in national energy and climate change policies as well as provide the possibility for the future connection of data centre development to a direct energy supply. This is a direct positive long-term residual effect at a national level.

7.8.3 Decommissioning Phase

With an operational life expectancy of 25-years, the plant will either be redeveloped / upgraded and continue in its current use as a substation, or the site will be redeveloped in an alternative form.

In the event where the substation is decommissioned, details of provisions to decommission and render safe or remove all materials, waste, ground, plant, or equipment contained on or in the site that may result in environmental pollution will be agreed and undertaken as required by the relevant planning conditions.

8.0 LAND, SOILS AND GEOLOGY

8.1 INTRODUCTION

This chapter of the EIAR assesses the effects of the proposed substation, as described in Chapter 3 'Description of the Development', on the land, soil and geological environment. Information on the existing soil and geological environment is presented as a baseline for the site. The potential effects of the proposed development are discussed along with recommended mitigation measures for each potential effect. Any residual and cumulative effects are also assessed.

The key design characteristics will include:

- EirGrid/ ESBN Control Room building
- Associated Internal 15kV and 110kV Underground Cabling
- Installation of a 15/110kV Transformer (TRAFO) with associated equipment including:
    - Cable Sealing End
    - Surge Arrestor
    - Earth Disconnect
    - Current /Voltage Transformer
    - Circuit Breaker
- 110kV underground cable to Barnakyle 110kV substation 3 No Power Ducts and 2 No Telecoms Ducts.
- Diesel Generator
- Security Fencing, Security Cameras and Poles
- Lights/Lamp Poles
- Lightning Masts
- Temporary Construction Compound
- And all other associated site development plant and equipment and other works including surface water and foul wastewater drainage, within an overall redline boundary measuring approximately 2.6 hectares.

Information on the design of the proposed development is provided in Chapter 3 'Description of Development'.

8.1.1 Statement of Authority

This chapter has been completed by John Dillon of TOBIN Consulting Engineers.

John Dillon (BSc., MSc., DIC, MCIWM, PGeo) is a hydrogeologist with 18 years' geological/hydrogeological experience on major infrastructure developments. John has authored numerous Land, Soils and Geology chapters for EIARs for a range of projects.

8.2 METHODOLOGY

The methodology used to produce this chapter included completing a desk study and a site walkover.

A desk study was undertaken to collate and review background information in advance of the site survey. The desk study involved the following:

- Examination of the Geological Survey of Ireland (GSI) datasets pertaining to geological and extractive industry data;
- Examination of Environmental Protection Agency (EPA) soil and subsoils datasets;
- Examination of National Parks and Wildlife Service (NPWS) nature conservation designations;
- Preparation of site maps and suitable field sheets for the site survey.

Site walkover surveys relating to the land, soil and geological environment was undertaken in February 2023. The site surveys included:

- A site walkover to review the ground conditions and assess the topography, land use, geomorphology and requirements for further investigations.

The information obtained is referenced throughout Section 8.3. Following the desk top study and the site survey, geological maps were generated in GIS and are included in Figures 8-1 and 8-2.

8.2.1 Relevant Guidance

This chapter has been prepared having regard to the following guidelines:

- Guidelines on the Information to be contained in Environmental Impact Assessment Reports (Environmental Protection Agency, 2022);
- Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (NRA 2008);
- Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements (IGI 2013);
- Good practice guidelines on the control of water pollution from construction sites (Construction Industry Research and Information Association (c532 CIRIA 2001);
- Environmental Protection Agency., 2023. EPA Map Viewer. http://gis.epa.ie/Envision;
- Geological Survey of Ireland., 2023. Department of Communication, Energy and Natural Resources: Online Mapping. https://www.gsi.ie/Mapping.htm, and
- GeoHive., 2023. Ordnance Survey Ireland: Spatial data. www.geohive.ie.
- Consultation

These potential impacts are included below in Section 8.4.

8.2.2 Public Information Sources

- Published geological, soil, groundwater, surface water, aquifer, and recharge data obtained from the Geological Survey of Ireland (GSI);
- National Parks and Wildlife Service data of designated conservation areas;
- Waste and IPPC licensed facility data from EPA Geoportal;
- Irish Geological Heritage site map from the GSI (www.gsi.ie);
- EPA online Envision Map Viewer (www.epa.ie);

- Flood history of site from OPW National Flood Hazard Mapping website (www.floodmaps.ie);
- Catchment flood risk assessment & management study (http://www.cfram.ie/pfra/); and,
- Aerial Photography from ESRI (ArcGIS).

8.3 EXISTING ENVIRONMENT

The existing environment is discussed in this chapter in terms of geomorphology (landscape and topography) and superficial solid geology. The regional review of geological conditions covers a zone of 2 km from the site boundary, as suggested in the Institute of Geologists of Ireland (IGI) guidelines[1] (2013).

The proposed development site is located at Profile Park, Dublin 22. The site location is shown in Figure 8-1.

The proposed development site is located within industrial landscape which has recently be developed. An existing datacentre is adjacent to the proposed development's boundary.

The Grange Castle Golf Club is located approximately 0.2km to the east and northeast of the proposed development. The entire proposed project is described in detail in Chapter 3 of this EIAR.

8.3.1 Site Topography and Geomorphology

The topography of the proposed grid connection can be described as mostly flat. The GSI data does not indicate there are any geomorphology features within the site boundary.

8.3.2 Land Use

The overall site of the proposed development measures c. 2.6ha and is predominantly covered by rough grassland, surrounded by industrial, commercial and transport units. Access is via the existing road network, located off the R134.

The infrastructure delivery route is along the R134 through artificial surfaces associated with industrial, commercial and transport units, as shown in Figure 8-1.

8.3.3 Regional Soils and Subsoils

The regional soils in this area, including the grid and gas connection. Based on mapping by the EPA this indicates that this site consists of 2 no. types of soil, namely:

- BminPD – Basic deep poorly drained mineral;
- BminDW – Basic deep well drained mineral.

[1] Institute of Geologists of Ireland (2013) Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements

The development area within the red line boundary is underlain mostly by basic deep poorly drained material.

Figure 8-1 Subsoil Mapshows the regional subsoils in this area, including the area within the red line boundary and grid/gas connection. The dominant subsoil occurring in the region is classified as till. The site is underlain by till derived from limestone (TLS).

The till, which is Quaternary in age, formed as an extensive envelope of the landscape in the area since deglaciation approximately 7,000 – 10,000 years ago. Based on the site walkover date the site is underlain by firm, brown and grey slightly gravelly silty CLAY with occasional cobbles and pieces of broken rock. Gravel is subangular to subrounded, fine to medium. Cobbles are subangular to subrounded.

8.3.4 Bedrock

The bedrock geology on the GSI 1:100 000 map indicate that this site is underlain by Lucan Formation limestone. The regional bedrock geology covering the proposed site and grid/ gas connection is shown in Figure 8-2 Geology Map and a description of the formation is presented below.

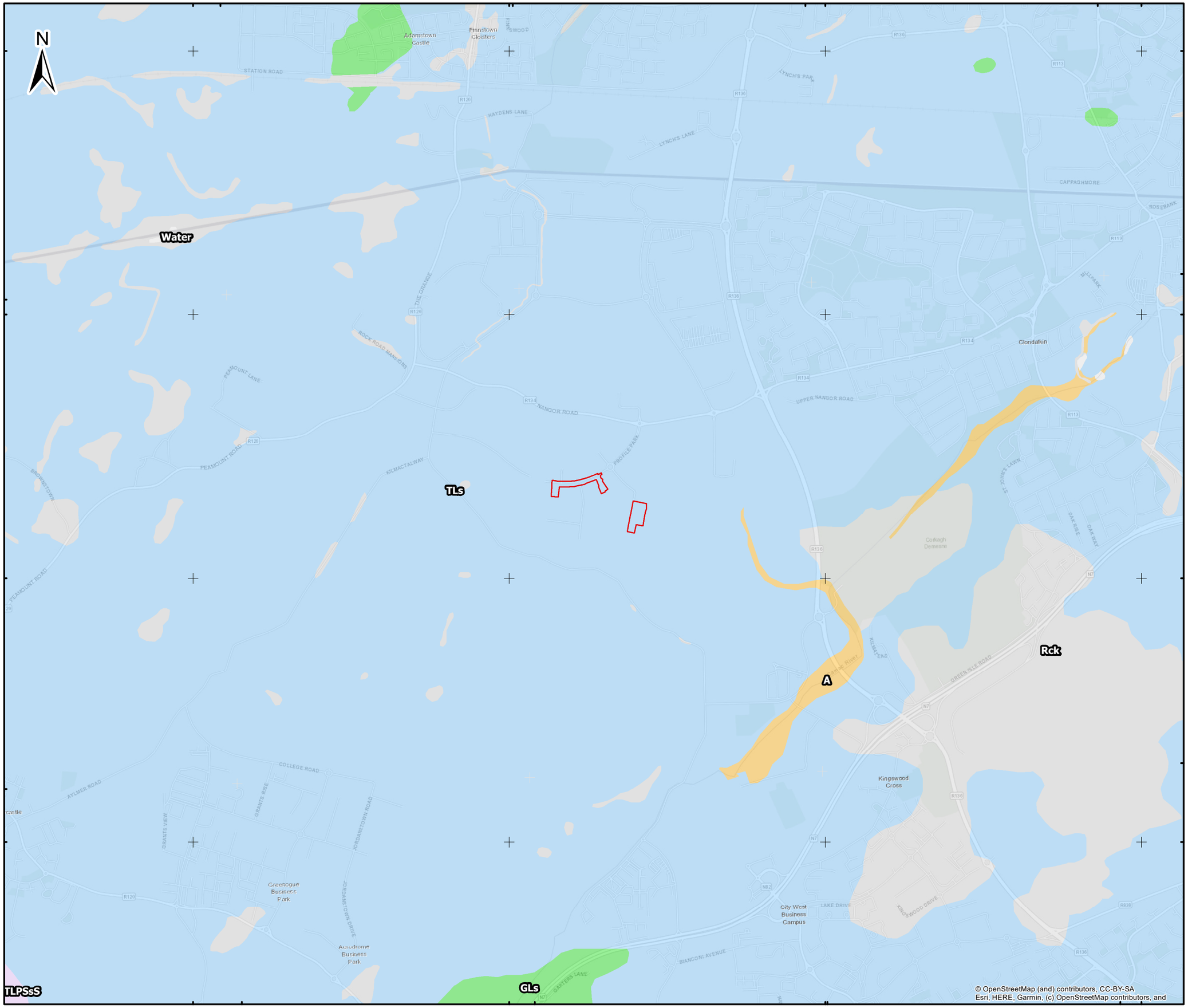
The GSI database contain records of verified borehole logs, groundwater wells and springs within and close to the site of the granted power plant. Bedrock exposures in the local area indicate strong to moderately strong, dark grey, fine grained, argillaceous limestones with minor calcareous shales.

6°28'30"W 6°27'0"W 6°25'30"W 6°24'0"W

53°19'30"N 53°18'0"N

733000 731500 730000 728500

701400 703200 705000 706800



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Legend

Planning Application Boundary

Subsoils

- A, Alluvium
- GLs, Gravels derived from Limestones
- Rck, Bedrock outcrop or subcrop
- TLPSsS, Till derived from Lower Palaeozoic sandstones and shales
- TLs, Till derived from limestones
- Water

0 250 500 750 1,000
Meters

NOTES

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

A	23/05/2023	Final issue	S.P	C.N
Rev	Date	Description	By	Chkd.

Client: Greener Ideas

Project:
Profile Park power plant - Substation Application

Title:
Figure 8-1:
Subsoils Map

Scale @ A3: 1:20,000

Prepared by:	Checked by:	Date:
S.Pezzetta	C.Naughton	May 2023

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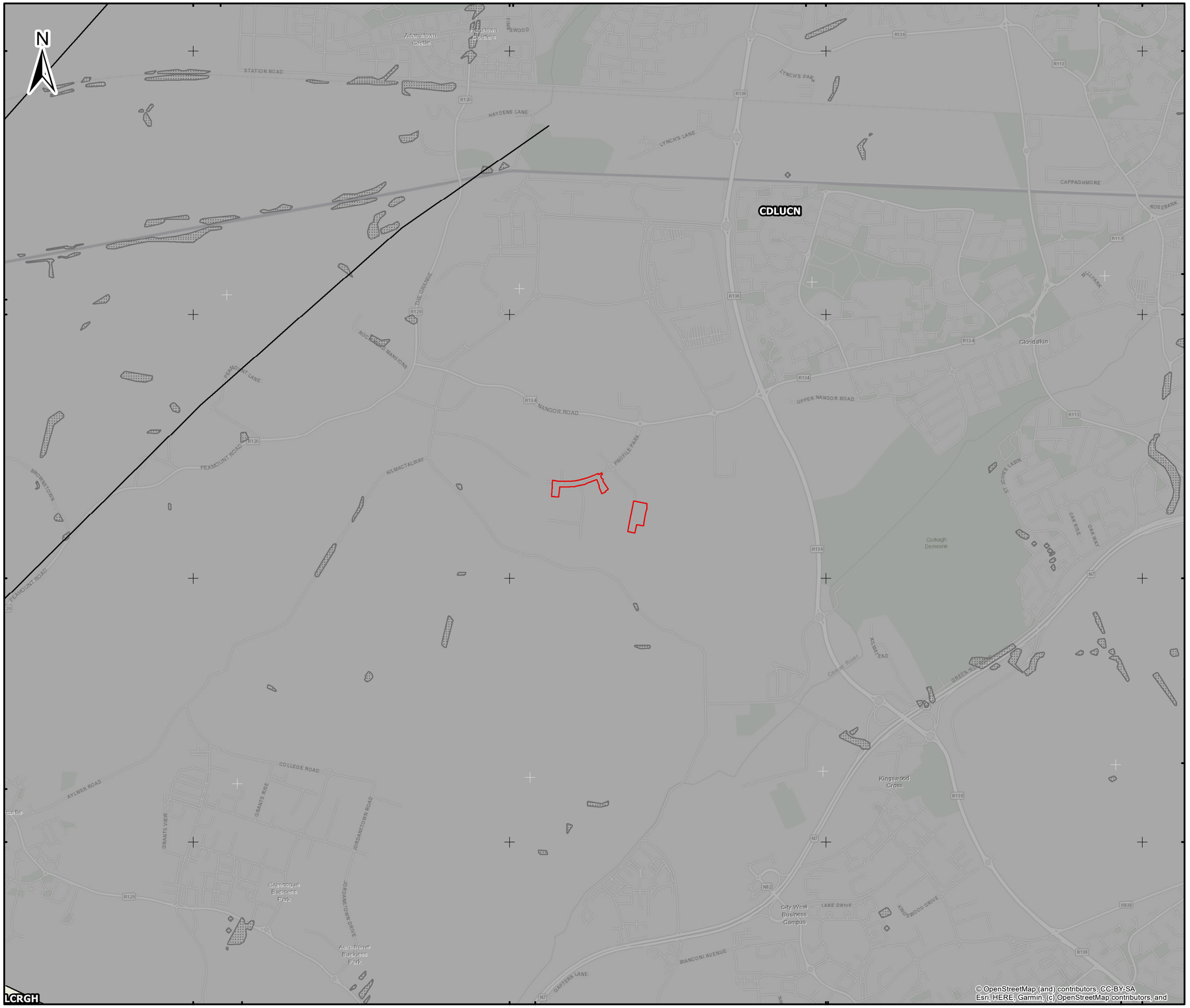
Draft: A



Legend

- Planning Application Boundary

Bedrock Geology

- Lucan Formation
- Carrighill Formation
- Faults
- Bedrock Outcrop

0 250 500 750 1,000

Meters

NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
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Rev	Date	Description	By	Chkd
A	23/05/2023	Final issue	S.P	C.N

Client: Greener Ideas

Project:

Profile Park power plant - Substation Application

Title:

Figure 8-2:
Bedrock Geology Map

Scale @ A3: 1:20,000

Prepared by:	Checked by:	Date:
S.Pezzetta	C.Naughton	May 2023

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Map Ref: 11069-007-B.GEO-S.BO-TOB-A

Draft: A

8.3.5 Mineral / Aggregate Resources

A historical (currently inactive) quarry lies approximately 0.6km to the south of the southern site boundary. No active mineral or aggregate sources have been identified by GSI data within 2km of the site boundary.

The GSI online Aggregate Potential Mapping Database shows that the site is located within an area mapped as being typically moderate in terms of crushed rock aggregate potential, with some areas of low to high potential. There are no significant mapped areas of granular aggregate potential (i.e., potential for gravel reserves).

8.3.6 Geological Heritage

According to the Geological Survey of Ireland Spatial Resources, there are no Irish Geological Heritage sites inside the site boundary. No geological heritage sites have been identified within 2km of the site boundary. Belgard Quarry, a large active quarry, is located 2.2 km southeast of the proposed development. Belgard is the largest limestone quarry in the country and is excavating the Lucan Formation limestones. It is a designated County Geological Site (Site Code: SD002) of vital economic importance and of geological heritage significance.

8.3.7 Soil Contamination

A review of the EPA website[2] for both existing and historic licensed and illegal waste activities was carried out to identify any potential contamination sources present in the area and to identify any potential contaminating activities near the proposed development. The desk study indicated that no waste facilities, illegal waste activities within a 2km radius of the proposed site. The has is a greenfield site with no previous development. No visual or olfactory evidence of contamination was noted during the site walkover.

8.3.8 Geohazards

A review of the landslide information on the GSI Irish Landslides Database indicate that there are no recorded landslide events within 2km, or within a wider context of 6km of the site. The site walkover conducted on the 13th February 2023 confirmed the site is generally very flat comprising topsoil underlain by firm glacial till.

[2] www.epa.ie – accessed in April 2023

8.4 POTENTIAL EFFECTS OF THE DEVELOPMENT

The environmental effect of the development of the proposed project are discussed and assessed in the following sections. The 'do-nothing' scenario is reviewed and potential effects are assessed for three stages of the project life cycle; i.e., construction, operation and decommissioning.

8.4.1 Do-Nothing Scenario

The do-nothing situation relevant to soils and geology is where the proposed project does not proceed, the areas would remain as they currently are (i.e., artificial surfaces made up of industrial, commercial and transport units).

Within the proposed grid connection, the clayey soil and artificial surfaces would remain as present. The site as a whole would fall under the industrial management at Profile Park but given its zoning it is a reasonable assumption that it would be developed with similar infrastructure to the granted power plant which is a land use type compatible with the zoning objectives set out in the South Dublin County Development Plan 2022-2028.

The do-nothing scenario would result in no effect to the existing soils and geology conditions in the area.

8.4.2 Potential Effects During Construction

The proposed development is characterised by pre-construction gradually phasing out to a number of main civil engineering works to provide the necessary infrastructure for completion.

The pre-construction phase of development includes preparatory works (i.e., post planning surveys and reporting) and consultation with statutory bodies and the public. Following this process, site clearance activities will commence, the construction phase comprise civil and plant construction works. These include:

- Construction of access and hardstands (temporary contractor's compound, temporary site offices, welfare facilities, car parking and equipment laydown areas);
- Topsoil stripping of the construction working area (and localised at certain locations along the cable/ gas pipeline route), the removal of ditches, trees, and other vegetation from the site;
- Processing of materials and reinstatement;
- Construction of infrastructure foundations (infrastructure foundations, parking, site entrance);
- Excavation for cable ducts, gas pipeline, tank farm, infrastructure foundations;
- Management of excavated materials; and,
- Construction of surface water drainage system along the new access to site.

The entire project as described in Chapter 2 of this EIAR (Description of the Proposed Development) has been considered in this impact assessment. The effects of the construction activities are discussed further in the following sections.

8.4.2.1 Land Use

The site of the proposed development is predominantly covered by till soils. There is an extensive network of existing access roads adjacent to the site to facilitate the ongoing commercial needs of Profile Park, Dublin 22.

The proposed development makes use of existing access roads thereby further minimising the potential for land use impacts.

The pre-mitigation construction potential impact is imperceptible, negative, and long-term due to the relatively small footprint of infrastructure and its location.

8.4.2.2 Hydrocarbon Release

Wherever there are vehicles and plant in use, there is the potential for hydro-carbon release which may contaminate the soil and subsoil. A spill has the potential to indirectly pollute water, if the soil and subsoil act as a pathway from any source of pollution. Any spill of fuel or oil would potentially present a moderate, long-term negative effect on the soil and geological environment. Good site practice can mitigate any effect (Refer to Section 8.5 Mitigation Measures).

8.4.2.3 Excavations

The construction of the development will require removal of topsoil and subsoil to a competent founding layer and upfilling with structural fill and/or concrete (concrete only proposed for the (tank farm, oil supply and storage, engine hall, electrical annex building, transformers, workshop, parking and plant associated structures) to the required finished floor level.

Materials required for the construction works will be sourced locally. Material importation to site will be required such as ready mixed concrete, road surface, etc. The use of off-site material importation will increase the environmental effect of other aspects of the development by requiring the need to transport material to site. The relatively shallow excavations into bedrock will create a temporary exposure of bedrock which will provide additional in-situ information of the soils and geology in the area. Overall, the excavations will have a neutral environmental effect.

All grid-connection cable laying works will be carried out as per EirGrid requirements, which have been described in Chapter 3 (Description of Development) of this EIAR.

The grid connection will be laid beneath the ground surface and/or private road. The area where excavations are planned will be the subject of a confirmatory survey, prior to the commencement of works. A verification condition survey will be carried out for all parts of the route within the public road. A trench will be opened using an excavator to accommodate the formation. The excavated material will be cast to the side to be reused as backfilling material where appropriate. This material will not be stored in the vicinity of any watercourse and will be smoothed with the back of an excavator bucket to minimise runoff. It will be cast on the upgradient side of the trench, so if any runoff did occur it will run into the downgradient trench. Excess material will be used on the site of the proposed development for local landscaping, further detail is provided in Chapter 3 (Description of Development,).

Overall, the excavation required for the grid connection will have an imperceptible, temporary and neutral environmental effect on soils and geology.

8.4.2.4 Geohazards

The walkover study carried out in February 2023 found the entire area within the site boundary comprising low permeability clays, matching the till cover mapped by the GSI. The lay of the land across the site is considered to be relatively flat.

The local subsoil data has been reviewed together with the GSI landslide susceptibility classification. No areas of peat or other geohazards were identified within or in proximity to the site proposed development. No areas of potential instability were identified during the site walkovers.

Mitigation measures to address localised stability issues such as battering of excavations are outlined in Section 8.5.

8.4.3 Potential Effects During Operation

During the operational phase of the project, no new impacts on the soil and geological environment will arise. A few direct impacts are possible during the operational phase of the proposed development. These may include:

- Some construction traffic may be necessary for maintenance of the site which could result in minor accidental leaks or spills of fuels/ oils affecting the groundwater; and
- There is potential for spills and leaks of oils from infrastructure and equipment resulting in contamination of soils and water.

The operational impacts have the potential to negatively affect the ground or water directly. However, mitigation measures/standard design measures and management controls will negate this risk (refer to Section 8.5.2).

No cumulative impacts on the soils and geology environment are envisaged during the operational stage, as there will be no significant movement of soils/subsoils, or construction works, during this period.

The effects of operation on natural resources such as land, soils and geology will be imperceptible and long-term.

8.4.4 Potential Effects During Decommissioning

In general, the potential effects associated with decommissioning will be similar to those associated with construction but of reduced magnitude because extensive excavation, and wet concrete handling will not be required. The potential environmental effect of soil stockpiling and contamination by fuel leaks are present during decommissioning. The potential for impact as a result is slight to not significant.

Foundations and the grid connection infrastructure will remain in place underground and would be covered with earth and allowed to revegetate or reseed as appropriate. The site access/ road will be in use for additional purposes to the operation of the commercial usage (e.g., for Profile Park) by the time the decommissioning of the project is to be considered, and therefore will remain in-situ for future use.

The proposed substation is expected to be operational for at least 25 years. On cessation of activities, the substation will either be redeveloped / upgraded and continue in its current use as a substation, or the site will be redeveloped in an alternative form.

8.4.5 Summary of Potential Impacts

A summary of the significance criteria is outlined below for the construction, operational and decommissioning phase in Tables 8-1 to 8-3.

Table 8-1: Significance of Land and Soils Criteria – Construction Phase (Pre-mitigation)

Environmental Attribute (Land, Soil and Geology)	Cable Route and substation
Geological heritage sites	No Irish Geological Heritage (IGH) sites at proposed site. -Imperceptible
Contaminated sites	No contaminated sites identified - Imperceptible
Contamination of soil by potential pollutants/hydrocarbons	Slight - unlikely, direct and short term on localised soils and bedrock within the site boundary
Identification of karst/geohazard features	No Karst/peat features - Imperceptible
Mineral resources and Mines	None identified, imperceptible
Land and Soils (Natural resources)	Negligible and permanent due to relocation of soils within the site boundary

Table 8-2: Significance of Land and Soils Criteria – Operational Phase (Pre-mitigation)

Environmental Attribute (Land, Soil and Geology)	Cable Route and substation
Geological heritage sites	No IGH sites at proposed site. -Imperceptible
Contaminated sites	No contaminated sites identified - Imperceptible
Contamination of soil by potential pollutants/hydrocarbons	Slight - unlikely, direct and long-term
Karst/geohazards features	No Karst features- Imperceptible
Mineral resources and Mines	None identified, imperceptible
Land and Soils (Natural resources)	Not significant no excavations during operational phase- Imperceptible

Table 8-3: Significance of Land and Soils Criteria – Decommissioning Phase (Pre-mitigation)

Environmental Attribute (Land, Soil and Geology)	Cable Route and substation
Geological heritage sites	No IGH sites at proposed site. -Imperceptible
Contaminated sites	No contaminated sites identified - Imperceptible
Contamination of soil by potential pollutants/hydrocarbons	Slight - unlikely, direct and short term due to relocation of soils and bedrock within the site boundary
Identification of hydrogeological features from the GSI karst database	No Karst features Imperceptible
Mineral resources and Mines	None identified, imperceptible
Geohazards	Not significant, certain and permanent
Land and Soils (Natural resources)	Slight - certain and permanent due to relocation of soils within the site boundary

Overall, the potential impacts are slight/not significant. Mitigation measures are identified in Section 8.5 to address these impacts.

8.4.6 Major Accidents

As part of the requirements of the EIA Directive, the applicant is requested to consider the "Expected Significant Adverse Effects of the project on the environment deriving from the vulnerability of the project to risks of major accidents and/or disasters which are relevant to the project concerned."

This section describes the expected significant effects on the environment arising from the vulnerability of the proposed development to risks of major accidents and/or natural disasters which are relevant to the project.

As set out in the EIA guidance there are two main considerations:

- The potential of the project to cause accidents and/or disasters, including implications for human health, cultural heritage, and the environment;
- The vulnerability of the project to potential disasters/accidents, including the risk to the project of both natural disasters (e.g., flooding) and man-made disasters (e.g., technological disasters).

Low consequence events, such as minor spills, have been scoped out as these events are unlikely to result in significant adverse effects as they do not fall into the definition of a Major Accidents and Disasters. The proposed development (and associated works) to natural disasters

In relation to major accidents, the following geological hazards do not occur on the site:

- Earthquakes do not occur in a sufficient intensity at the site;
- No karst risk occurs on the site due to the underlying geology; and

- There are no deposits in the proposed footprint that give rise to a major accident or disaster (e.g., landslide).

No significant geohazards arise on the site due to the lack of peat soils or low gradients in the proposed footprint. Hardstand areas surround the substations and infrastructure areas which further limits fire risk potential. There is no significant impact from fire on the land and soils environment as a result of the proposed development.

In relation to land, soils and geology, it can be concluded that the risk of accidents associated with this development is very low and would not cause unusual, significant or adverse effects on land and soils environment during the construction, operational and decommissioning phase.

8.5 MITIGATION MEASURES

Mitigation measures for the construction, operation and decommissioning of Baldonnell Substation to avoid or reduce the potential effect of the proposed development are presented below. A number of mitigation measures considered for soil and geology are similar to those relating to hydrology and hydrogeology, further detail can be found in Chapter 9 'Hydrology and Hydrogeology'.

8.5.1 Mitigation Measures During Construction Phase

The construction of the development has the potential (with no mitigation) to cause "not significant" short-term to long-term effects to the soil and geology of the proposed development site. Implementing mitigation measures detailed below will reduce the significance of the effects. The mitigation measures have been based on CIRIA (Construction Industry Research and Information Association, UK) technical guidance on water pollution control and on current accepted best practice (CIRIA, 2001). Good site practice will be applied to ensure no fuels, oils, wastes or any other substances are stored in a manner on site in which they may spill and enter the ground. Dedicated, bunded storage areas will be used for all fuels or hazardous substances.

All works will be managed and carried out in accordance with the Construction and Environmental Management Plan (CEMP) which is included in Appendix 3-2.

8.5.2 Management of Excavated Materials

The disturbance and excavation of soil, subsoil and bedrock is an unavoidable effect of the development, but every effort will be made to ensure that the amount of earth materials excavated is kept to a minimum in order to limit the effect on the geological aspects of the site. The management of geological materials and spoil is an important component of controlling dust and sediment and erosion control. Excavated soils and bedrock will only be moved short distances from the point of extraction and will be used locally for landscaping. Landscaping areas will be sealed and levelled using the back of an excavator bucket to prevent erosion. The upper vegetative layer will be stored with the vegetation part of the sod facing the right way up to encourage growth of plants and vegetation at the surface of the landscaped soils.

These measures will prevent the erosion of soil in the short and long term. Soils, overburden, and rock will be reused on site to reinstate any excavations where appropriate.

To ensure slope stability, excavations will be battered back (sloped) to between 1:1 and 1:2 depending on depth and type of material. All excavation works during the construction stage will be monitored by an experienced engineer.

Mitigation measures will be put in place during the construction of the scheme to reduce the likelihood of an excavation collapsing. Mitigation measures include construction of a granular berm or temporary sheet pile wall to support the clays during construction. There is a very low risk of landslide (high factor of safety) which is further reduced by implementation of the mitigation measures.

8.5.2.1.1 Management of Fuel and Oil

The CEMP (Appendix 3-2 of this EIAR) provides details on measures and mitigation in relation to the management of fuels and oils on site. These include:

- Minimal refuelling or maintenance of construction vehicles or plant will take place on site. Off-site refuelling will occur at a controlled fuelling station;
- Mobile bowsers, tanks and drums will be stored in secure, bunded, impermeable storage area, away from drains and open water;
- Fuel containers will be stored within a secondary containment system e.g., bund for static tanks or a drip tray for mobile stores;
- Ancillary equipment such as hoses, pipes will be contained within the bund;
- Taps, nozzles or valves will be fitted with a lock system;
- Fuel and oil stores including tanks and drums will be regularly inspected for leaks and signs of damage;
- Only designated trained operators will be authorised to refuel plant on site;
- An emergency plan for the construction phase to deal with emergency accidents or spills is contained within the CEMP (Appendix 3-2 of this EIAR); and
- An emergency spill kit with oil boom and absorbers will be kept on site in the event of an accidental spill. All site operatives will be trained in its use.

8.5.2.2 Excavations

The materials to be encountered are likely to be relatively stable during the excavation for the infrastructure foundations. A physical barrier can be implemented between the excavations and the potentially unstable material at unstable conditions, in the form of a granular berm or sheet piles. The long-term stability of the area around the proposed development will be achieved by filling the area back up to existing ground level following installation of the foundation and sealing the subsoil environment with artificial surfaces with managed drainage network.

Excavation works will be monitored by a suitably qualified and experienced geotechnical engineer or engineering geologist. The earthworks will not be scheduled to be carried out during severe weather conditions.

Following these mitigation measures, the resultant effect will be not significant, permanent and negative.

8.5.3 Mitigation Measures During Operational Phase

Fuel will be bunded in accordance with the requirements set out in the EPA publication, 'Storage and Transfer of Materials for Scheduled Activities' (2004), which states bunds are to contain 110% of the volume of the tank in the event of a tank rupture.

The operational team will carry out maintenance works and will put in place mitigation measures to reduce the risk of hydrocarbon or oil spills during the operational phase of the substation.

The proposed mitigation measures during the operational phase are as follows:

- Minimal refuelling or maintenance of operational vehicles or plant will take place on site.
- Potential impact of spillages and/ or leaks will be mitigated against by proper management and design of plant including impermeable bunded areas, were required. All storage areas will be designed in accordance with current oil storage regulations, local fire authority requirements and in accordance with BS8007:1987, Code of Practice for design of concrete structures for retaining aqueous liquids; and
- Fuel Storage areas where required will be bunded appropriately for the fuel storage volume for the time period of the operation and fitted with a storm drainage system and an appropriate oil interceptor; and
- On site re-fuelling will be undertaken using a double skinned bowser with spill kits on the ready for accidental leakages or spillages.

8.5.3.1 Land Use

It is intended that soils (topsoil) and subsoils will be reused for site landscaping.

In order to minimise the potential impacts to Land Use, the following mitigation measures are proposed:

- Minimising areas for earthworks thereby reducing land take requirements;
- Restricting areas for construction works and temporary storage to a minimum within site boundary;
- The handling, storage and re-use of excavated materials are of importance during the construction phase of the project. Stockpiles will be located away from the watercourses and drainage ditches. Topsoil and subsoils will be stored near the landscaping and in the reinstatement of development site areas. Topsoil will be stockpiled no higher than 2.5m and follow the recommendations set out in the NRA Guidelines for the Management of Waste from National Road Construction Projects (NRA, 2014);

8.5.4 Mitigation Measures During Decommissioning Phase

Decommissioning will comprise the removal of all over ground elements.

The site roadways / access roads may be in use for additional purposes to the operation of or future use of the development area (e.g., for commercial access/ egress) by the time the decommissioning of the project is to be considered, and therefore the site roads will remain in-situ for future use. Some of the hardstand material will be removed where required, and along with the substation foundations, covered in topsoil and revegetated. The substation and grid connection infrastructure will form part of the permanent national grid network.

The risks associated with leaving roads and site entrance in-situ are relatively low. The decommissioning phase will not require any significant works that will impact the land and soils environment.

A fuel management plan to avoid contamination by fuel leakage during decommissioning works will be implemented as per the construction phase mitigation measures.

Mitigation measures applied during decommissioning activities will be similar to those applied during construction where relevant. Some of the impacts will be avoided by leaving elements of the Proposed Development in place where appropriate. The foundations will be rehabilitated by covering with local topsoil in order to regenerate vegetation which will reduce runoff and

sedimentation effects. Roads and site entrances will be maintained for future users. 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 in Section 8.5.1.

8.6 CUMULATIVE IMPACTS

Cumulative effects of this project with other developments in the region, as discussed in Chapter 4 - Policy, Planning and Development Context, relate to the effects on soils and geology. Due to the majority of access roads to the site development are pre-existing at the site, the demand for external aggregate (natural resources) for roads is greatly reduced, therefore limiting the potential for cumulative impacts.

It is not envisioned that there will be any significant effects in relation to soils and geology during the construction phase given efficient design along with material management such as using local nearby quarries for the construction phase will ensure optimisation of the volume of materials required to be imported to site. This will mitigate any cumulative effects relating to importing of material and use of public roads as haul roads.

A review of the Local Authority Planning Register shows that the following 'other developments' as described below are relevant planning applications in terms of the 10km zone of influence radius surrounding the proposed development site.

Based on a review of the projects within 5km of the site there are no projects which give rise to significant cumulative impacts on land, soils and geology.

No cumulative impacts on the soils and geology environment are envisaged during the construction, operational and decommissioning stage. Pre mitigation, there will be a slight risk of pollution from hydrocarbons or other leakage from machinery but with mitigation, this is not likely to add to a significant cumulative effect.

8.7 RESIDUAL IMPACTS

The replacement of topsoil, subsoils and rock, with gravels, concrete and impermeable surfaces for the construction of the infrastructure (temporary and permanent) will result in a change in ground conditions within the proposed development site. Overall, this residual effect is permanent but not significant.

All potential effects on the soil and geological environment will be mitigated through good site practice on vehicular movements, management of fuels, sustainable use of soils etc. Overall, the residual effects from these aspects will be not significant to imperceptible, temporary and negative.

8.7.1 Summary of Residual Impacts

A summary of the significance criteria is outlined below for the construction, operational and decommissioning phase in Tables 8-4 to 8-6.

Table 8-4: Significance of Land and Soils Criteria – Construction Phase (Post-mitigation)

Environmental Attribute (Land, Soil and Geology)	Cable Route and substation
Geological heritage sites	No IGH sites at proposed site. -Imperceptible
Contaminated sites	No contaminated sites identified - Imperceptible
Contamination of soil by potential pollutants/hydrocarbons	Not significant - unlikely, direct and short term on localised soils and bedrock within the site boundary
Identification of karst features	No Karst features - Imperceptible
Mineral resources and Mines	Not applicable, imperceptible
Geohazards	No significant peat deposits encountered. Unlikely Imperceptible to Not significant
Land and Soils (Natural resources)	Not significant - certain and permanent due to relocation of soils and bedrock within the site boundary. Soils to be reused within the site for the landscaping.

Table 8-5: Significance of Land and Soils Criteria – Operational Phase (Post-mitigation)

Environmental Attribute (Land, Soil and Geology)	Cable Route and substation
Geological heritage sites	No IGH sites at proposed site. -Imperceptible
Contaminated sites	No contaminated sites identified – Imperceptible
Contamination of soil by potential pollutants/hydrocarbons	Not Significant - unlikely, direct and short term due to relocation of soils and bedrock within the site boundary
Identification of karst features	No Karst features- Imperceptible
Mineral resources and Mines	None identified, imperceptible
Peat stability	No peat deposits encountered Imperceptible
Geohazards	No significant excavations - Imperceptible
Land and Soils (Natural resources)	No significant excavations - Imperceptible

Table 8-6: Significance of Land and Soils Criteria – Decommissioning Phase (Post-mitigation)

Environmental Attribute (Land, Soil and Geology)	Cable Route and substation
Geological heritage sites	No IGH sites at proposed site. -Imperceptible

Environmental Attribute (Land, Soil and Geology)	Cable Route and substation
Contaminated sites	No contaminated sites identified - Imperceptible
Contamination of soil by potential pollutants/hydrocarbons	Not Significant - unlikely, direct and short term due to relocation of soils and bedrock within the site boundary
Identification of hydrogeological features from the GSI karst database	No Karst features Imperceptible
Mineral resources and Mines	None identified, imperceptible
Geohazards	Not significant, certain and permanent
Land and Soils (Natural resources)	Imperceptible - No changes to substation and cables as a result of decommissioning

Overall, the potential impacts are of imperceptible/not significant with the implementation of the mitigation measures.

8.8 CONCLUSION

Overall, the development at Profile Park, Dublin 22 will not have a significant negative impact on the soil and geological environment based on the mitigations measures that will be put in place and managed.

No significant Geohazards or contamination issues occur on the proposed site. The proposed development site is not a sensitive site in terms of the soils and geological environment. This is primarily due to predeveloped commercial land with artificial surfaces mixed with historical agricultural soils. In terms of the soil and geological environment, the proposed project is not expected to contribute to any significant, negative cumulative effects on other existing developments in the vicinity.

9.0 HYDROLOGY & HYDROGEOLOGY

9.1 INTRODUCTION

This chapter describes the existing hydrological, hydrogeological and water quality characteristics at the site of the proposed project. The potential effects on the water environment arising from the development of the substation and associated infrastructure, including the grid connection, are assessed. The drainage of the project is considered which includes proposed mitigation measures to reduce any potential negative effects associated with the construction, operation and decommissioning of the proposed development. Any residual effects are also assessed.

Planning Permission is being sought for the installation of a substation and all associated infrastructure, which are described in detail in Chapter 3 of this EIAR (Description of the Development).

The proposed development will comprise of:

- EirGrid/ ESBN Control Room building
- Associated Internal 15kV and 110kV Underground Cabling
- Installation of a 15/110kV Transformer (TRAFO) with associated equipment including:
    - Cable Sealing End
    - Surge Arrestor
    - Earth Disconnect
    - Current /Voltage Transformer
    - Circuit Breaker
- 110kV underground cable to Barnakyle 110kV substation 3 No Power Ducts and 2 No Telecoms Ducts.
- Diesel Generator
- Security Fencing, Security Cameras and Poles
- Lights/Lamp Poles
- Lightning Masts
- Temporary Construction Compound
- And all other associated site development plant and equipment and other works including surface water and foul wastewater drainage, within an overall redline boundary measuring approximately 2.6 hectares.

Information on the design is provided in Chapter 3 'Description of Development'.

9.1.1 Statement of Authority

TOBIN Consulting Engineers (TOBIN) have completed this chapter. This chapter has been completed by John Dillon, TOBIN hydrogeologists with over 18-years' experience respectively, specialising in environmental site assessments and EIAs. Mistaya Langridge, TOBIN water resources engineer, has been responsible for carrying out the site-specific hydraulic modelling Flood Risk Assessment.

9.1.2 Scope of Assessment

The scope of the assessment undertaken is set out as follows:

1. Characterise the hydrological and hydrogeological baseline conditions of the existing environment based on a desktop study and site investigation;
2. Identify the possible impacts of the proposed development during construction, operation and decommissioning of the project on the receiving hydrological and hydrogeological environment;
3. Develop mitigation measures to reduce or eliminate the identified potential negative impacts; and
4. Identify any residual impacts after mitigation measures are implemented.

9.1.3 Legislative / Guidance Review

This EIAR has been prepared in accordance with the requirements of the codified Directive 2011/92/EU as amended by Directive 2014/52/EU (hereafter referred to as the 'amended Directive').

This EIAR has been prepared with reference to the requirements of the following legislation (where relevant):

- S.I. No. 293 of 1988: European Communities (Quality of Salmonid Waters) Regulations;
- S.I. No. 272/2009 - European Communities Environmental Objectives (Surface Waters) Regulations 2009, as amended;
- S.I. No. 9/2010 - European Communities Environmental Objectives (Groundwater) Regulations 2010, as amended;
- S.I. No. 477/2011 - European Communities (Birds and Natural Habitats) Regulations 2011;
- Consolidated EIA Directive 2011/92/EU as amended by Directive 2014/52/EU;
- European Communities (Water Policy) Regulations 2003 [S.I. No. 722/2003];
- Waste Management Act 1996, as amended;
- Water Framework Directive (2000/60/EEC); and
- Groundwater Directives (80/68/EEC) and (2006/118/EC).

The hydrology and hydrogeology section of the EIAR is carried out in accordance with guidance contained in the following:

- "Guidelines on the Information to be contained in Environmental Impact Statements" (EPA, 2002);
- "Guidelines on the Information to be contained in Environmental Impact Assessment Reports" (EPA, 2022);
- The guidelines and recommendations of the Institute of Geologists of Ireland (IGI) publication 'Geology in Environmental Impact Statements – A Guide' (2002);
- Inland Fisheries Ireland (2016) "Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites";
- IGI Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements (2013);
- Good Practice During Proposed Development Construction (Scottish Natural Heritage, 2010);
- PPG2 – Above ground oil storage tanks;
- PPG5 – Works or Maintenance in or near water;
- CIRIA (Construction Industry Research and Information Association) 2006: Guidance on 'Control of Water Pollution from Linear Construction Projects' (CIRIA Report No. C648, 2006);

- CIRIA C697 SuDS Manual; and
- CIRIA 2006: Control of Water Pollution from Construction Sites - Guidance for Consultants and Contractors. CIRIA C532. London, 2006.

9.1.4 Study Methodology

An examination of the existing hydrological/hydrogeological regime was carried out through a combination of consultation with relevant authorities (i.e., South Dublin County Council), a desktop review of the hydrological/hydrogeological resources, and site-specific fieldwork. These elements are described further below.

The assessment of the water environment consisted of the following:

- A desk study of available information, including a review of site investigations relating to surface water and groundwater, undertaken within or adjacent to the site;
- A walkover of the site and surrounding area;
- Drainage distribution and catchment mapping;
- Interpretation of all data to establish the baseline environment; and
- Assessment of flood risk.

Information retained by the Geological Survey of Ireland (GSI), the Office of Public Works (OPW) and EPA was accessed to provide the hydrological and hydrogeological setting of the site. Relevant documents and datasets used to provide the setting of the site included EPA Water Quality Data, topography maps, and GSI Hydrogeological Data.

The relevant sections of the South Dublin County Development Plan 2022 - 2028 were also consulted in the preparation of this report.

The following sources of information were utilised to establish the baseline environment:

- The Geological Survey of Ireland (GSI) groundwater records for the area were inspected with reference to hydrology and hydrogeology;
- Office of Public Works (OPW) flood mapping;
- Catchment Flood Risk Assessment and Management (CFRAM) and Preliminary Flood Risk Assessment (PFRA) map data;
- EPA water quality monitoring data for watercourses in the area;
- EPA Water Framework Directive Monitoring Programme;
- Information from the 2nd Cycle River Basin Management Plan, 2018-2021; and
- Site visit of the study area.

TOBIN Consulting Engineers carried out an investigation in February 2023, in order to assess the water environment in the vicinity of the proposed development.

In this chapter, the potential impacts on the water environment resulting from the proposed development are evaluated and mitigation measures are proposed to reduce any significant impacts. Based on the mitigation measures proposed, the significance of the residual impact on the water environment is determined.

The significance of effects of the proposed development has been assessed in accordance with the EPA guidance document *Guidelines on the Information to be contained in Environmental*

Impact Assessment Reports (2022)[1]. Table 2-2 (available in Chapter 2) is taken from the EPA document. It outlines guidance for describing the quality and significance of effects.

The magnitude of any effects considers the likely scale of the predicted change to the baseline conditions, resulting from the predicted effect and takes into account the duration of the effect, i.e., temporary or permanent.

Potential effects may have negative, neutral or positive qualities where:

- Positive effect – A change which improves the quality of the environment;
- Neutral effect – A change which does not affect the quality of the environment; and
- Negative effect – A change which reduces the quality of the environment.

The diagram below shows how comparison of the character of the predicted effect to the sensitivity of the receiving environment can determine the significance of the impact.

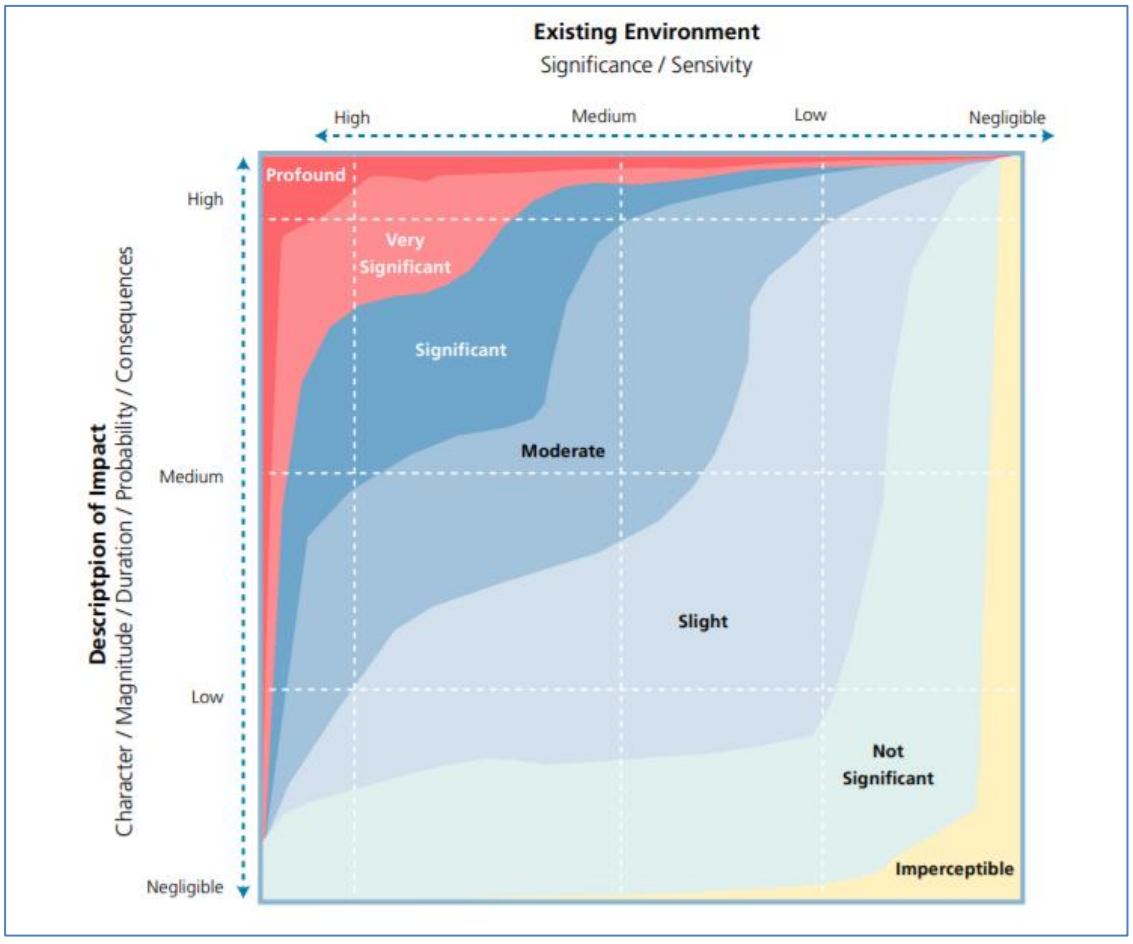


Diagram 1 EIAR significance of effects matrix (EPA, 2022)

In order for a potential effect to be realised, three factors must be present. There must be a source of a potential effect, a receptor which can be adversely affected and a pathway or connection which allows the source to effect the receptor. Only when all three factors are present can an effect be realised.

[1] https://www.epa.ie/pubs/advice/ea/EPA%20EIAR%20Guidelines.pdf

9.1.4.1 Consultation

Consultation took place with a number of organisations including the following relevant bodies:

- An Bord Pleanála;
- South Dublin County Council;
- Inland Fisheries Ireland;
- Geological Survey of Ireland;
- Department of Arts, Heritage and the Gaeltacht;
- Waterways Ireland;
- EPA; and
- The Office of Public Works.

9.2 EXISTING ENVIRONMENT

9.2.1.1 Site Walkover and Investigations

Field work involved:

- A walkover survey of the site to identify hydrological features on site, wet ground, drainage patterns and distribution, exposures, drains, etc.

Following the field survey, the results were reviewed in ArcGIS software in conjunction with publicly available hydrological and hydrogeological data from the GSI, EPA and OPW. Various maps were produced, representing a graphical interpretation of the field results.

On a regional scale, the site at Profile Park and its environs is located within the Liffey and Dublin Bay Hydrometric Area and Catchment. The delineation of the sub-catchments and general area of confluence is shown in Figure 9-1 'Regional Catchment Delineation Overview'.

The proposed development site is located within the National River Basin District of the 2nd cycle river basin management plan, formerly the Eastern River Basin District (ERBD) within the 1st cycle river basin management plan. At a local scale, the Baldonnell Stream (EPA Code: 09B09) flows through the site from in a north-south direction. The Baldonnell stream continues to flow northwards, discharging into the Griffeen River which then discharges into the River Liffey at Lucan.

9.2.2 Topography

The topography of the proposed development site is mostly flat with elevations from c.73 mAOD to 76 mAOD. Surface water flows generally in a northward's direction towards the River Liffey.

9.2.3 Surface Water Hydrology

The purpose of this section is to describe the surface water environment including the following:

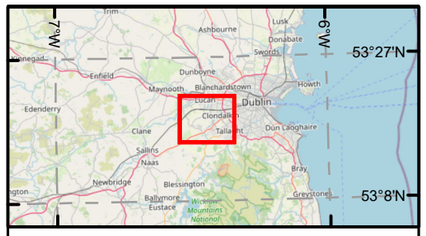
- Catchments;
- Site surface water features and drainage;
- Flood risk assessment;
- Assessment of hydrometric data;
- Surface water abstractions within the catchment of the site; and
- Surface water quality.

9.2.3.1 Catchments

A catchment, also referred to as a drainage basin and watershed, is a topographic area that collects and discharges surface streamflow through one outlet or mouth (Mays, 2012[2]). The catchment boundary is the line dividing land where surface drainage flows toward a given stream from land where it drains into a separate stream.

The regional natural surface water drainage pattern, in the environs of the Profile Park proposed development site is shown on Figure 9-1 'Regional Catchment Delineation Overview'. The proposed development site is located within the River Liffey and Dublin Bay catchment, located within the National River Basin District. The proposed development is not located within a catchment which has identified ecological habitats such as Natural Heritage Areas, Special Areas Conservations and Special Protection Areas.

2 Ground and Surface Water Hydrology. Mays K.W. (2012)



Legend

- Planning Application Boundary
- WFD - River Water bodies
- WFD - Subcatchments

0 500 1,000 1,500 2,000
Meters

NOTES

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

Rev	Date	Description	By	Chkd.
A	23/05/2023	Final issue	S.P	C.N

Client: Greener Ideas

Project:
Profile Park power plant - Substation Application

Title:
Figure 9-1:
Surface water feature and local catchments

Scale @ A3: 1:40,000

Prepared by:	Checked by:	Date:
S.Pezzetta	C.Naughton	May 2023

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Map Ref: 11069-008-RI-CAs-TOB-A

Draft: A

The proposed development lies within the Liffey sub catchment, identified in Table 9-1 below.

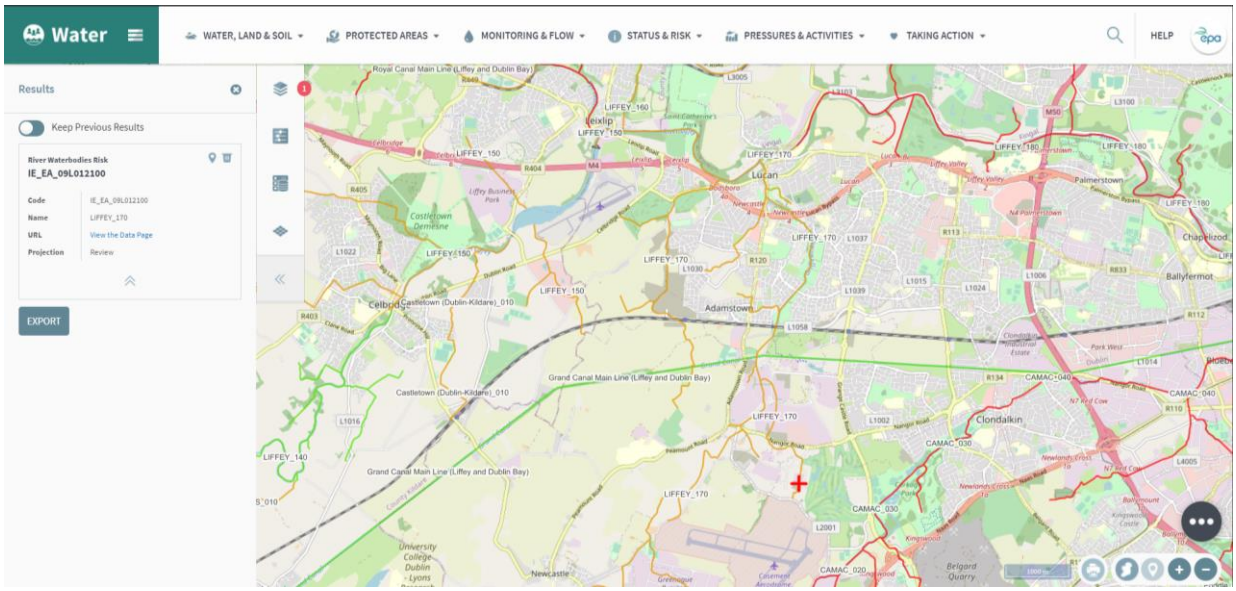

Table 9-1: Waterbodies (within 2km radius) and the Proposed Development Site

Catchment (Catchment ID)	WFD Sub-catchment (Sub catchment ID)	River Network EPA Name (Eden Code)	River Waterbody WFD Status 2013 – 2018 (River Name & Code)	River Waterbody WFD Risk (3rd Cycle) 2020-2027
Liffey and Dublin Bay (9)	Liffey_SC_090 (09_15)	Baldonnell Stream (09B09)	Good Liffey_170 (IE_EA_09L012100)	Under Review
		Camac (09C02)	Poor Camac_030 (IE_EA_09C020310)	At Risk

The EIAR study area comprises of approximately 2 ha and has a few surface water features in the region of the site. The study area includes the grid connection. The main regional surface water features include the following:

- Griffeen River (located approximately 1km northwest of the development); and
- Liffey River (located approximately 4.5km north of the development).

This catchment includes the area drained by the River Liffey and by all streams entering tidal water between Sea Mount and Sorrento Point, Co. Dublin, draining a total area of 1,616km^2. The largest urban centre in the catchment is Dublin City. The other main urban centres are Dun Laoghaire, Lucan, Clonee, Dunboyne, Leixlip, Maynooth, Kilcock, Celbridge, Newcastle, Rathcoole, Clane, Kill, Sallins, Johnstown, Naas, Newbridge, Athgarvan, Kilcullen and Blessington. The total population of the catchment is approximately 1,255,000.

The River Liffey rises on the western slopes of Tonduff in the Wicklow Mountains, from where it flows west, before being joined by the Brittas River from the north and then flowing into the northern end of Pollaphuca Reservoir (created by the ESB in the 1930s). The Liffey flows out of the reservoir through the Pollaphuca generating station and into the lower reservoir and generating station at Golden Falls. The Liffey then flows west though Kilcullen before flowing through Newbridge, then past Sallins and Clane, after which it is joined by the Morell from the south.

The Liffey continues through Celbridge to Leixlip, before which it flows into Leixlip reservoir and generating station. The Liffey then enters a steep-sided valley, through which it flows past Islandbridge, where the river becomes tidal, and through the centre of Dublin City.

9.2.3.2 Surface Water Features & Drainage within the Site Boundary

The proposed development consists primarily of commercial land, mostly comprised of artificial surfaces made up of industrial, commercial and transport units.

The Baldonnell Stream (IE_EA_09L012100) is located within the site boundary. The EPA maps show the stream to run through the central portion of the proposed development in a north-south orientation. The Baldonnell Stream joins the Griffeen River (IE_EA_09L012100) approximately 1.3km downstream from the proposed development. The Griffeen River then joins the Liffey River (IE_EA_09L012350) at Lucan, located 4.8km north of and downstream from the proposed development.

The neighbouring data centre site has diverted the upstream section of Baldonnell Stream where it has been culverted under their site before it enters a 'V-Shaped' channel within the proposed development. The diverted stream enters the proposed development at the south-eastern corner, where it continues to flow northwards along the 'V-shaped' channel which has steep grassy banks up to 3m in height. The Baldonnell Stream follows the development site's eastern boundary before it is culverted beneath the existing road through a concrete circular culvert measuring approximately 1m in diameter. The Baldonnell Stream is 0.3 to 0.6m in width, with water depths averaging at 0.2m in the winter period, the stream flow was mostly gentle, and the substrate varied from clayey cobbles to silt.

Minor surface water ponding occurs on the site. The surface water ponding is considered to be seasonal and mainly associated with periods of heavy, prolonged and intense rainfall. The

ponding forms as a result of acceptance of drainage from the adjacent site and of natural attenuation of rain. The ponding has minor connectivity with the Baldonnell Stream (Liffey_170, IE_EA_09L012100) through the small drainage pipe located at the south-eastern corner of the proposed site.

9.2.3.3 Flood Risk Assessment

TOBIN Consulting Engineers were appointed by Greener Ideas Limited to undertake a Flood Risk Assessment (FRA) for the construction of a new 110kV substation at Profile Park, West Dublin. The Flood Risk Assessment is provided in Appendix 9-1.

The Planning System and Flood Risk Management (PSFRM) Guidelines (OPW/DoEHLG, 2009) classify substations as essential infrastructure, and "highly vulnerable" in terms of their sensitivity to flooding. The proposed development was assessed for suitability through the PSFRM Justification Test.

Pluvial Flooding:

Pluvial flood risk has not been noted by existing flood mapping.

Groundwater Flooding:

There is no evidence to suggest groundwater as a potential source of flood risk to the proposed development site.

Coastal/Tidal Flooding:

The site is not at risk of coastal flooding due to its elevation and distance inland.

Fluvial Flooding:

The Baldonnell Stream, a tributary of the Griffeen River, is located east of the proposed substation and adjacent to the approved power plant. Previous flood studies in the area (CFRAM and PFRA) modelled the Griffeen and Camac Rivers, however the Baldonnell Stream was not explicitly modelled. CFRAM modelling of the area shows the site as liable to fluvial flooding, without accounting for the conveyance capacity of the Baldonnell Stream.

To quantify the risk of fluvial flooding from the Baldonnell Stream, a site-specific hydraulic model was prepared. Based on the results of this model, it is estimated that the Baldonnell Stream will not burst its banks under existing flow conditions; however, the subject site may be impacted due to climate change (0.1% AEP High End Future Scenario).

Proposed site regrading (proposed elevations ≥74.80mOD) provide more than 0.80m freeboard above the predicted 0.1% AEP HEFS flood level, removing the proposed development from the future floodplain.

The adjacent power plant, granted planning permission, also proposed raising ground levels to 74.80mOD or higher, which in turn, will sever the flow path of flood waters from the Baldonnell Stream to the site of the proposed substation. In this scenario, the need for compensation storage is eliminated as flood waters from the Baldonnell Stream will be unable to encroach the subject site.

Based on the result of site-specific modelling, and a detailed assessment of existing flood mapping, it is predicted that the development will have an imperceptible impact on flood risk upstream/downstream of the subject site, and that the risk of fluvial flooding associated with the development will be minimal. The development satisfies the criteria of the PSFRM's Justification Test.

9.2.3.4 Assessment of Hydrometric Data

The natural surface water drainage pattern in the environs of the proposed development site is shown in Figure 9-1.

It was noted that there were no hydrometric stations located in the immediate environs of the proposed development site. Although hydrometric stations do exist on watercourses downstream of the development, they include flows coming from a number of different tributaries. As such, they are not representative of the actual flows occurring at the site.

9.2.3.5 Surface Water Pressures within the Site

There are currently no known surface water abstractions from the streams adjacent to the site and the EPA has identified no river abstraction pressures upstream or downstream of the site.

The EPA (www.catchment.ie accessed in April 2023) has identified the Baldonnell Stream (Liffey_170, IE_EA_09L012100) to be under significant pressures at risk of not meeting their water quality objectives under the Water Framework Directive, namely from urban run-off and urban wastewater.

9.2.3.5.1 Cable Route

The electrical generator associated with each gas engine will connect to a main transformer where the voltage will be increased to 110 kV. Electrical power will then be exported via an underground cable from the plant's main transformer to an offsite electrical substation.

The proposed grid connection will consist of underground cabling (UGC).

The underground cable route exits the proposed Baldonnell 110kV Substation from the northside fence and heads in a westerly direction. The route follows the private road (Falcon Avenue) west for approximately 250m until it reaches the entrance to Barnakyle 110kV Substation. The cable then turns south to enter the Barnakyle substation through existing ducts. This section of the route is almost entirely within the road except for the crossover into the substation.

A site layout of the proposed Baldonnell 110kV substation and associated grid connection is provided under Figure 3-1 of Chapter 3 of this EIAR.

The UGC works will consist of the installation of 6 No. ducts in an excavated trench to accommodate 3 No. power cables, 2 No. fibre communications cable to allow communications between the Baldonnell and ESB Barnakyle 110kV Substation and one earth continuity conductor (ECC).

There are no drainage/ stream crossings identified from aerial and GSI mapping. Further details of the cable crossings, and the proposed methodologies, are provided in Chapter 3 of this EIAR (Description of Development). No instream works are proposed for the cable works.

The specification for cables and cable installation will be in accordance with EirGrid requirements and within the parameters assessed in this EIAR.

9.2.3.6 Surface Water Quality

Environmental Protection Agency Records:

The Environmental Protection Agency (EPA) regularly monitors water bodies in Ireland as part of their remit under the Water Framework Directive (WFD) (2000/60/EC), which requires that rivers are maintained or restored to good/ favourable status. The quality of watercourses is assessed in terms of 4 No. quality classes; 'unpolluted' (Class A), 'slightly polluted' (Class B), 'moderately polluted' (Class C) and 'seriously polluted' (Class D). These water quality classes, and the water quality monitoring programme are described in the EPA publication 'Water Quality in Ireland, 2003'. The water quality assessments are largely based on biological surveys. Biological Quality Ratings or Biotic Indices (Q values) ranging from Q1 to Q5 are defined as part of the biological river quality classification system. The relationship of these indices to the water quality classes defined above, are set out in Table 9-2 below.

Table 9-2: Relationship between Biotic Indices and Water Quality Classes

Biotic Index	Quality Status	Quality Class
Q5, 4-5, 4	Unpolluted	Class A
Q3-4	Slightly Polluted	Class B
Q3, 2-3	Moderately Polluted	Class C
Q2, 1-2, 1	Seriously Polluted	Class D

No monitoring locations were recorded on the Baldonnell Stream within or upgradient of the site due to the limited stream size. However, samples were recorded downgradient of the site boundary c. 3.9 km and c. 4.8km on the Griffeen River (RS09G010500 and RS09G010600 respectively) which feeds into the River Liffey (RS09L012100) at Lucan. The locations of the biological quality stations are included in Table 9-3 and Figure 9-2 below.

Table 9-3: Relationship between Biotic Indices and Water Quality Classes (Sourced from EPA Maps/ Water, accessed in February 2021)

Location	Griffeen – First Bridge E. of Milltown	Griffeen – Esker Br	Griffeen - In Lucan Village (Gauging Station)	Lucan Br
Distance from site boundary	1.2 km	3.9 km	4.8 km	5.1 km
Up or down gradient	Upgradient	Downgradient	Downgradient	Downgradient
River Waterbody Name	Liffey_170	Liffey_170	Liffey_170	Liffey_170
River Waterbody Code	IE_EA_09L012100	IE_EA_09L012100	IE_EA_09L012100	IE_EA_09L012100
Segment Code	09_1079	09_1120	09_242	09_916
Station Code	RS09G010200	RS09G010500	RS09G010600	RS09L012100
2019	-	-	Q3, Poor (Operational)	Q3-4, Moderate (Operational)
1991	Q3, Poor (PreWFD)	Q3, Poor (PreWFD)	-	-

The majority of EPA monitoring points indicate that the overall water quality in this area is moderately polluted. The overall status of surface water/rivers in the vicinity of the proposed site is deemed poor. This classification is based on a medium macroinvertebrate value (Q-Value) according to www.wfdireland.ie.

The EPA has assigned WFD River Waterbody Approved Risks to a number of waterbodies. The WFD Status (2013-2018) of Liffey_0170 is good. The Baldonnell Stream within the site, feeding into the River Liffey (_170) is currently 'under review' within the WFD Risk 3rd cycle. River Liffey (_170) was 'at risk' according to (2010-2015) 2nd WFD assessment cycle, with significant pressures including urban wastewater and runoff.

9.2.4 Hydrogeology/Groundwater

The information provided herein relates to the hydrogeology or groundwater environment. It is provided to give context to the groundwater characteristics and flow patterns within and adjacent to the proposed project site.

9.2.4.1 Existing Groundwater Quality

The study area lies within the following groundwater waterbody (GWB), Dublin (IE_EA_G_008). The Water Framework Directive (www.wfdireland.ie) for the period 2013-2018 describes the groundwater quality status as 'Good' for Dublin GWB. These classifications are based on an assessment of the point and diffuse sources in the area that may affect the groundwater quality.

9.2.4.2 Aquifer Potential and Characteristics

Reference to the National Aquifer Map prepared by the GSI (www.GSI.ie) indicates that there is one type of Bedrock Aquifer underlying the proposed site. The bedrock aquifer is a Locally Important aquifer which is moderately productive in local zones (Ll).

The subsoil deposits overlying the bedrock are not considered to be of sufficient lateral extent, depth or permeability to represent an aquifer body and are mainly comprised of low permeability limestone till. Summarised below in Table 9-4 are the aquifer characteristics of the underlying aquifer.

Table 9-4: Bedrock Aquifer Classification and Characteristics

Aquifer Classification	Permeability/Flow Mechanism	Bedrock	Karst Features
Locally Important (Ll)	Productive only in Local Zones	Dark limestone and shale underlying the entire site	No

No significant dissolution features (i.e., karst) were observed from visual appraisal of the proposed site and no karst features are recorded within the GSI Karst Database of Ireland within a 2km radius of the proposed development site.

9.2.4.3 Groundwater Vulnerability

Groundwater vulnerability represents the intrinsic geological and hydrogeological characteristics that determine how easily groundwater may be contaminated by activities at the surface. Vulnerability depends on the quantity of contaminants that can reach the groundwater, the time taken by water to infiltrate to the water table, and the attenuating capacity of the geological deposits through which the water travels.

These factors are controlled by the types of subsoils that overlie the groundwater, the way in which the contaminants recharge the geological deposits (whether point or diffuse), and the unsaturated thickness of geological deposits from the point of contaminant discharge. The groundwater vulnerability throughout the proposed site is at H (High).

9.2.4.4 Groundwater Usage

According to South Dublin County Council and Irish Water, no public water scheme (PWS) is present within a 2km radius of the site. No groundwater abstractions were identified within 5km from the site (as shown in Figure 9-1 'Regional Surface Water Features/Catchment Delineation').

According to the GSI database, there are no recorded wells within the proposed development study area. According to the GSI well data, there are no known water supply wells within1 km of the proposed development.

9.2.4.5 Groundwater Flow

On a regional scale, the groundwater flow direction is generally a subdued reflection of surface water drainage. Therefore, on a regional scale, the groundwater flow direction is considered to be toward the surrounding tributaries, which feed into the River Liffey to north of the proposed development. Local and regional groundwater flow is generally northwards with local groundwater flow discharging to the local streams i.e., Baldonnell Stream feeds into the River Liffey.

9.3 POTENTIAL EFFECTS

9.3.1 Introduction

This section addresses the potential effects on the hydrological and hydrogeological environment as a result of the development of the proposed development site. The potential effects may comprise direct and indirect effects on the quality of surface waters and groundwater. Thus, the hydrological and hydrogeological assessment identified water sensitive receptors located within the proposed site area and downstream from the proposed infrastructure works.

Annex III of the amended EIA Directive uses the following criteria to consider such effects:

- the magnitude and spatial extent of the effect (for example geographical area and size of the population likely to be affected);
- the nature of the effect;
- the transboundary nature of the effect;
- the intensity and complexity of the effect;
- the probability of the effect;
- the expected onset, duration, frequency, and reversibility of the effect;
- the cumulation of the effect with the effect of other existing and/or approved projects; and
- the possibility of effectively reducing the effect.

The current proposals for all construction activities and operational infrastructure were reviewed to identify activities likely to effect upon identified water bodies including relevant water courses within and remote from the site. Following the identification of sensitive water receptors and potential effects to the water environment at the development stage, the extent and severity of potential construction, operational, decommissioning and cumulative effects were evaluated, taking into account all proposed control measures included in the project design.

9.3.1.1 Sensitivity of Receptors

The sensitivity of an environmental receptor is based on its ability to absorb an effect without perceptible change. The hydrological environment is considered to be of low sensitivity for

receptors draining to the Liffey River via hydrological links. The EPA has found the water quality in the receiving waters to be poor (Q3).

9.3.2 Do Nothing Scenario

If the development does not proceed, the proposed development site and surrounding areas would remain as they currently are (i.e., artificial surfaces made up of industrial, commercial and transport units). The site would fall under the industrial management at Profile Park. This would result in no effect to the existing hydrological and hydrogeological conditions in the area.

9.3.3 Worst Case Scenario

Localised and short-term contamination of surface water streams could occur during the construction and operational phases, which in turn could affect the ecology and quality of the downstream water bodies of the Liffey River. Also, there is the potential for localised groundwater contamination to occur. However, good environmental practice will be observed on-site and mitigation measures, as outlined in Section 9.6, will be put in place to prevent this from happening.

9.3.4 Construction Phase

9.3.4.1 Construction Activities

The construction phase of the development will involve the following key activities that could have potential impacts on surface water and groundwater conditions:

- Earthworks related to:
    - Construction of temporary and permanent infrastructure on site, including foundations, hardstands, fuel/oil bunds, site access, substation, construction compounds, and all associated onsite infrastructure;
    - Laying of underground electrical cabling, both within the proposed development site, and as part of the route to the off-site electrical substation; and
    - Stockpiling material.
- Handling and storage of hydrocarbons, concrete, urea, and other potential water pollutants.

A CEMP (Appendix 3-2 of the EIAR) was developed for the project to ensure adequate protection of the water environment. The construction of the temporary site compounds, site access, substation infrastructure foundations, bunds, hardstands, laying of underground electrical cabling and drainage channels will involve the removal of vegetation, the excavation of mineral subsoil and rock. Exposed and disturbed ground may increase the risk of erosion and subsequent sediment laden surface water runoff. The release of suspended solids is primarily a consequence of the physical disturbance of the ground during the construction phase, if not correctly compacted.

Incorrect site management of earthworks and excavations could, therefore, lead to loss of suspended solids to surface waters as a consequence of the following activities:

- Soil stripping, to construct the site access/ entrance, site compounds, substation infrastructure foundations, hardstands, fuel bunds within site, laying of underground cabling and substation;

- Run-off and erosion from soil stockpiles (prior to reinstatement/profiling/side casting).

9.3.4.2 Hydrology and Hydrogeological Impacts

Based on the construction phase activities outlined above, the potential hydrological and hydrogeological impacts can be summarised as follows:

- Surface water quality impacts;
- Surface water flow alterations; and
- Groundwater flow and quality impacts.

Hardstand areas and additional sealed surfaces could potentially reduce the infiltration capacity of the soils in areas where earthworks are undertaken and increase the rate and volume of direct surface runoff. Surface water control measures are incorporated into the design of the proposed development. The potential for an increase in runoff to streams is limited as surface water runoff will be controlled as part of the project design. Further detail is provided under Section 9.4 of this chapter.

Pre-mitigation, the potential construction impact will be an imperceptible neutral effect.

9.3.4.2.1 Pluvial Flooding

The Strategic Flood Risk Assessment (SFRA) does not indicate any pluvial flooding within the bounds of the proposed substation.

Surface water arising at developed areas of the site will be managed by a dedicated stormwater drainage system designed in accordance with Sustainable Drainage Systems (SuDS) principles, limiting discharge from the site to greenfield runoff rates.

It is estimated that the natural landscaping and topography of the site will provide safe exceedance flow paths and prevent surface water ponding, therefore minimising residual risks associated with an extreme flood event or a scenario where the stormwater drainage system becomes blocked.

On this basis, the proposed development is not at risk of pluvial flooding and there will be no cumulative effects on flood risk elsewhere, based on the Flood Risk Assessment. The proposed development will not significantly alter the drainage regime of the site. Therefore, no cumulative impacts on other projects are anticipated.

9.3.4.2.2 Fluvial Flooding

Based on the indicative flood mapping produced as part of the National PFRA Study, it is estimated that the proposed development is not at risk of fluvial flooding from watercourses in the area.

The landscaping and topography of the site also provides a natural overland flow path to convey water away from the essential infrastructure.

It is calculated that the stormwater management system proposed as part of the development will limit runoff from the site to greenfield runoff rates, therefore mitigating against an increase in flood risk elsewhere.

9.3.4.2.3 Groundwater Flooding

There is no evidence from Geological Survey Ireland mapping to suggest that groundwater is a potential source of flood risk to the proposed development site.

9.3.4.2.4 Coastal Flooding

Given the elevated nature of the proposed development site (72 mOD), there is no risk of coastal flooding.

Based on the results of the Flood Risk Assessment, it is estimated that the risk of flooding to the proposed development will be minimal, and that the development will not increase the risk of flooding elsewhere.

9.3.4.3 Earthworks (Removal of Vegetation Cover, Excavations and Stock Piling)

Construction phase activities of the proposed development will require earthworks resulting in the removal of vegetation cover and excavation of mineral subsoil and are detailed in the Description of the Proposed Development (Chapter 2). Potential sources of sediment laden water include:

- Drainage and seepage water resulting from infrastructure excavation;
- Stockpiled excavated material providing a point source of exposed sediment;
- Construction of the grid connection cable trench to substation resulting in entrainment of sediment from the excavations during construction; and
- Erosion of sediment from emplaced site drainage channels.

These activities can result in the release of suspended solids to surface watercourses, i.e., Baldonnell Stream, and could result in an increase in the suspended sediment load, leading to increased turbidity, which in turn could affect the water quality and fish stocks of downstream water bodies. Potential impacts are significant if not mitigated against. The pathways identified for construction earthworks are drainage and surface water discharge routes. The main receptors are downgradient rivers (Liffey) and associated dependent ecosystems.

The pre-mitigation impact is indirect, negative, significant, temporary and of a medium probability impact.

The main drainage channel will be diverted around the boundary of the site. Drainage width, side slopes and substrate will be replicated in the proposed drainage channels. Where existing drains need to be rerouted/reprofiled, the original bed material will be reused. The sizing of any new internal drainage crossings will maintain existing depth of flow and channel characteristics. Where required, culverts will be buried at an appropriate depth below the channel bed.

9.3.4.4 Cable Route

The excavations for cable route trenches may have a direct permanent impact on the exposed soils and rock in the form of increased erosion and sediment release that, without mitigation, could also have additional impacts on water quality (due to sedimentation of water courses).

Any excavations for the cable route will expose bare soil for a temporary period over a short section of the trench.

The trench will be backfilled immediately following the installation of each section of cabling. While the trench is open, there will be a potential impact to the adjacent watercourse of an increase in the concentration of suspended solids.

There are no significant watercourse crossings on the proposed grid connection route. The pre-mitigation impact of the Grid Route is considered as slight, brief and unlikely to impact due to the immediate backfilling following cable installation.

9.3.5 Operational Phase

Surface water arising at the site will be managed by a dedicated stormwater drainage system designed in accordance with SuDS, limiting discharge from the site to greenfield runoff rates. On this basis, it is predicted that the development of the site will not increase the risk of flooding elsewhere in the catchment.

The landscaping and topography of the site will provide safe exceedance flow paths and prevent surface water ponding to minimise residual risks associated with extreme flooding or blockage of the stormwater drainage system.

It is therefore estimated that the risk of pluvial flooding associated with the proposed development is minimal.

Groundwater Flooding:

There is no evidence to suggest groundwater as a potential source of flood risk to the proposed development site.

Coastal/Tidal Flooding:

The site is not at risk of coastal flooding due to its elevation and distance inland.

To quantify the risk of fluvial flooding from the Baldonnell Stream, a site-specific hydraulic model was prepared. Based on the results of this model, it is estimated that the Baldonnell Stream will not burst its banks under existing flow conditions; however, the subject site may be impacted due to climate change (0.1% AEP High End Future Scenario).

Proposed site regrading (proposed elevations ≥74.80mOD) provide more than 0.80m freeboard above the predicted 0.1% AEP HEFS flood level, removing the proposed development from the future floodplain.

The adjacent power plant, granted planning permission, also proposed raising ground levels to 74.80mOD or higher, which in turn, will sever the flow path of flood waters from the Baldonnell Stream to the site of the proposed substation. In this scenario, the need for compensation

storage is eliminated as flood waters from the Baldonnell Stream will be unable to encroach the subject site.

Using current ground elevations at both the approved power plant and proposed substation, the 0.1% AEP HEFS event from the Baldonnell Stream is expected to inundate a small portion of the subject site. Using the modelled design level of 73.85mOD, approximately 42.3m^3 of water will be displaced by the development. Using the CFRAM 0.1% AEP HEFS extents and by analysing the local topography, a more conservative design level of 74.00mOD was achieved and would displace approximately 117.20m^3. With an additional 231m^3 of floodplain storage available at the approved power plant, and severance of a flow path from the Baldonnell Stream, no additional compensatory measures need to be implemented.

Based on the result of site-specific modelling, and a detailed assessment of existing flood mapping, it is predicted that the development will have an imperceptible impact on flood risk upstream/downstream of the subject site, and that the risk of fluvial flooding associated with the development will be minimal.

The development satisfies the criteria of the PSFRM's Justification Test.

The greenfield runoff rate has been calculated based on the SuDS Manual C753 (CIRIA, 2015), South Dublin County Council's Development Plan, 2022-2028 and the non-statutory standards for SuDS (Defra, 2015). Details in relation to drainage and SuDS measures are included in the Engineering Services Report. With regard to water quality impacts, the main discharges occur as a result of surface water runoff (storm water) to the surface water environment during the operational phase. Surface water runoff will be generated from all surfaces within the facility that are exposed to rainwater or to which water is applied in order to clean. This includes all hardstanding surfaces, roofs, and other impermeable surfaces. Operational access will be required to the site for testing, maintenance and deliveries. There will be vehicles daily on the site at any given time. This may lead to occasional accidental emissions, in the form of oil, petrol or diesel leaks, which could cause localised contamination of site drainage/ surface water features, i.e., Baldonnell Stream. Due to the infrequent nature of visits, the risk of surface water pollution during operation is considered to be unlikely, not significant and short term.

The presence of site workers at the proposed development will lead to the generation of foul sewage from toilets and washing facilities. This foul sewage will be collected and discharged to the foul sewer network.

Due to the operational nature of the proposed site, the handling, containment, use and disposal of chemicals on site will be required at any given time leading to occasional accidental emissions of potentially polluting substances. This could cause localised contamination of site drainage/ surface water features, i.e., Baldonnell Stream.

Firefighting systems will be used during the operational phase of the proposed development. Mobile foam units will be used for immediate action against small local fires and the engine hall will be equipped with a number of powder and CO_2 extinguishers. Firefighting pump connected to the fire main will be operated on diesel. The risk to surface water pollution is considered to be likely and permanent.

The pre-mitigation impact is considered as significant, permanent and likely to impact on surface waters.

9.3.6 Decommissioning Phase

The proposed Baldonnell 110kV substation is expected to be operational in accordance with the adjacent gas fired power plant. The power plant is expected to be operational for at least 25 years. On cessation of activities, the plant will either be redeveloped as a power related facility, or the site will be redeveloped in an alternative form.

In the event that the substation is decommissioned, the following programme will be implemented:

- All plant equipment and machinery will be emptied, dismantled, and stored under appropriate conditions until it can be sold. If a buyer cannot be found, the material will be recycled or disposed of through licensed waste contractors and hauliers. If plant and machinery is required to be cleaned on site prior to removal, all necessary measures will be implemented to prevent the release of contaminants;
- All waste will be removed from the facility;
- The site and all associated buildings will be secured; and
- Waste will be recycled, wherever possible. Licensed waste contractors will control all waste movement, recycling, and disposal operations.

Decommissioning of the proposed development will involve the disassembly and removal of the development equipment and machinery. These impacts have been assessed similar to that of the Construction Phase and, therefore, the mitigation measures for the Construction Phase will also be implemented during decommissioning.

The pre-mitigation impact is considered as significant, long-term and likely to impact on surface waters.

9.3.6.1 Pre-mitigation Magnitude and Significance of Impact

The magnitude of an impact includes the timing, scale, size and duration of the potential impact. The magnitude criteria for hydrology/hydrogeology are defined as set out in Table 9-6 to 9-8 below.

Table 9-5: Pre-mitigation Magnitude and Significance of Hydrological/Hydrogeological Criteria – Construction

Criteria	Description	Duration and Frequency of Effects	Significance of Potential Effect
Runoff Regime	Potential localised increase in surface water runoff may be caused by impermeable areas on site. Impermeable areas may give rise to a slight increase in surface water flow locally but will not have a significant impact on the volumetric flow rate of downstream rivers. Diversion of existing channel.	Short term and rarely	Slight negative
Surface Water Quality	Sedimentation of drainage ditches and streams.	Temporary and occasional	Slight/moderate negative
Groundwater Levels	No change in groundwater is expected. No ZOCs or wells within 2km of proposed development.	Not applicable	Not significant
Groundwater Quality	Minor leaks or spills during the construction phase.	Short term and occasional	Not significant

Table 9-6: Pre-mitigation Magnitude and Significance of Hydrological/Hydrogeological Criteria – Operational

Criteria	Description	Duration and Frequency of Effects	Significance of Potential Effect
Runoff Regime	Increased surface runoff caused by impermeable areas on site may increase surface water flow locally but will not have a significant potential effect on the volumetric flow rate of downstream rivers. Site to be maintained at greenfield runoff rates.	Long term and rarely	Not significant
Surface Water Quality	Significant loss in water quality is expected in the form potentially polluting substances.	Short term and unlikely	Not significant
Groundwater Levels	No significant change in groundwater is expected.	Not applicable	Not significant
Groundwater Quality	Minor leaks or spills during the construction phase has the potential to affect groundwater quality	Long term and unlikely	Not significant

Table 9-7: Pre-mitigation Magnitude and Significance of Hydrological/Hydrogeological Criteria – Decommissioning

Criteria	Description	Duration and Frequency of Effects	Significance of Potential Effect
Runoff Regime	Potential localised increase in surface water runoff may be caused decommissioning activities on site. Impermeable areas may give rise to a slight increase in surface water flow locally but will not have a significant impact on the volumetric flow rate of downstream rivers.	Short term and rarely	Slight negative
Surface Water Quality	Sedimentation of drainage ditches and streams. Receptors include the onsite Baldonnell Stream.	Temporary and occasional	Slight/moderate negative
Groundwater Levels	No change in groundwater is expected. No ZOCs or wells within 2km of proposed development.	Not applicable	Not significant
Groundwater Quality	Minor leaks or spills during the decommissioning phase.	Short term and occasional	Not significant

9.4 MITIGATION MEASURES

As outlined in Chapter 3, Description of Development, the design of the proposed development has considered a range of best practice construction measures which will ensure avoidance and reduction of impacts throughout the construction, operational and decommissioning phases. Additional measures have been developed to mitigate the impacts identified in the preceding section.

9.4.1 Mitigation by Avoidance

In identifying and avoiding sensitive surface waters, the proposed development has implemented 'avoidance of impact' measures. Mitigation by avoidance is viewed as part of the 'Consideration of Alternatives' outlined in Chapter 5. Examples include moving the grid connection route away from Baldonnell Stream and locating fuel storage and construction compounds >50m from surface water streams.

9.4.2 Mitigation by Prevention and Reduction

Mitigation measures are outlined below and are considered as in-built to the design of the project. These mitigation measures are a combination of measures to comply with legislation and best practice construction methods to be implemented in order to prevent water (surface water and groundwater) pollution. Examples of these measures are the storage of potentially polluting materials in fully bunded tanks and controlling / reducing runoff from hardstand areas. Bund testing will be undertaken on a regular basis during the operation phase in accordance with BAT guidance.

9.4.3 Mitigation Measures – Construction Phase

In order to mitigate potential impacts during the construction phase, best practice construction methods will be implemented in order to prevent water (surface water and groundwater) pollution. A CEMP (Appendix 3-2 of the EIAR) was developed for the project to ensure adequate protection of the water environment. All personnel working on the project will be responsible for the environmental control of their work and will perform their duties in accordance with the requirements and procedures of the CEMP.

During the construction phase, all works associated with the construction of the development and associate grid connection to the substation will be undertaken in accordance with the guidance contained within CIRIA Document C741 'Environmental Good Practice on Site' (CIRIA, 2015). Any groundwater encountered will be managed and treated in accordance with CIRIA C750, 'Groundwater control: design and practice' (CIRIA, 2016).

All mitigation and management measures outlined hereunder will be incorporated into the CEMP (Appendix 3-2 of the EIAR). Mitigation measures are incorporated into the CEMP and will be incorporated into the specification for the Civil Engineering Works contract. The implementation of the Surface Water Management Plan will be overseen by a suitably qualified ecologist/engineer and will be regularly audited throughout the construction phase. The assigned ecologist/engineer will be required to stop works on site if he/she is of the opinion that a mitigation measure or corrective action is not being appropriately or effectively implemented.

Monitoring

It is recommended that local surface water features in the immediate vicinity of the site boundary are monitored pre-construction and during construction to take account of any variations in the quality of the local surface water and groundwater environment as a result of activities related to the proposed development. Monitoring of Baldonnell Stream (for water quality and turbidity) subject to Profile Park consent, will be undertaken pre-construction and during the construction period. A programme of inspection and maintenance will be designed, and dedicated construction personnel assigned to manage this programme. A checklist of the inspection and maintenance control measures will be developed, with records kept.

During the construction phase, field testing and laboratory analysis of a range of parameters will be undertaken at adjacent watercourses, specifically following heavy rainfall events (i.e., weekly, monthly and event based as appropriate).

9.4.3.1 Hardstanding

To minimise any impact on the underlying subsurface strata from material spillages, all oils and solvents used during construction will be stored within specially constructed dedicated bunded areas. Refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles will take place in a designated area of the site, away from surface water gullies or drains. Spill kits and hydrocarbon absorbent packs will be stored in this area and operators will be fully trained in the use of this equipment. For certain vehicles which are less mobile, refuelling may need to occur elsewhere on site. A spill kit will be stored with the bowser and the person

operating the bowser will be trained in their use. When not in use this will be stored in the designated area of the construction compounds.

All construction waste will be sorted and stored in on-site skips, prior to removal by a licensed waste management contractor.

9.4.3.2 Concrete

Concrete is required for the construction of the development infrastructure foundations. After concrete is poured at a construction site, the chutes of ready mixed concrete trucks must be washed out to remove the remaining concrete before it hardens. Wash out of the main concrete bottle will not be permitted on site; wash out is restricted only to chute wash out of trucks, mixers and concrete pumps. Wash down and washout of the concrete transporting vehicles will take place at an appropriate facility offsite.

The best management practice objectives for concrete chute washout are to collect and retain all the concrete washout water and solids in leak proof containers or impermeable lined wash out pits, so that the wash material does not reach the soil surface and then migrate to surface waters or into the groundwater. The collected concrete washout water and solids will be emptied on a regular basis. Washout will be undertaken at the construction compounds.

9.4.3.3 Fuels and Chemicals

With regards to on-site storage and handling of potentially pollutant materials:

- Fuels and chemicals will be stored within bunded areas as appropriate to guard against potential accidental spills or leakages. The bund area will have a volume of at least 110 % of the volume of such materials stored;
- All on-site refuelling will be carried out by a trained competent operative;
- Mobile measures such as drip trays and fuel absorbent mats kept with all plant and bowsers and will be used as required during all refuelling operations;
- A spill kit will be stored with the bowser and the person operating the bowser will be trained in their use;
- All equipment and machinery will have regular checking for leakages and quality of performance, and will carry spill kits;
- Any servicing of vehicles will be confined to designated and suitably protected areas such as construction compounds; and
- Additional drip trays and spill kits will be kept available on site, to ensure that any spills from vehicles are contained and removed off site.

9.4.3.4 Erosion and Sediment Control

Runoff will be maintained at Greenfield (pre-development) runoff rates. The layout of the development has been designed to collect surface water runoff from hardstanding areas within the development and discharge to associated surface water attenuation adjacent to the proposed infrastructure. It will then be managed by gravity flow at Greenfield runoff rates.

Silt fences will be installed along the eastern boundary of the proposed development to ensure there is no runoff into Baldonnell Stream. Silt fences will be constructed using a permeable filter fabric (Hy-Tex Terrastop Premium silt fence or similar), which will be installed as per the

manufacturer's guidelines and will be maintained until vegetation on the disturbed ground has been re-established. Once installed, the silt fence will be inspected regularly (daily) during construction and more frequently (hourly) during heavy rainfall (i.e., if there is a yellow weather warning in place or if the rainfall is greater than 5mm in a 1-hour period).

Suspended solid (silt) removal features will be implemented in accordance with CIRIA C697 SuDS Manual, and CIRIA C648 Control of water pollution from linear construction projects.

9.4.3.4.1 Interceptor Drains

Interceptor drains/diversion ditches will be installed ahead of the main earthworks activities to minimise the effects of collected water on the stripped/exposed soils once earthworks commence. This drainage will integrate into the existing site drainage. These drainage ditches will be installed on the upgradient boundary of the areas affected by the foundation edge earthworks operations and installed ahead of the main foundation construction operations commencing. They will generally follow the natural flow of the ground. The interceptor drains will intercept any storm water surface run-off and collect it to the existing low points in the ground, allowing the clean water flows to be transferred independently through the works without mixing with the construction drainage.

9.4.3.4.2 Swales

Infrastructure drainage/swales are required to control run-off from the running surface to lower water levels in the subgrade, to control surface water and to carry this flow to outlet points. Swales will be installed in advance of the main construction phase and will provide additional storage of storm water where located along gradient.

Swales will be re-vegetated by hydro-seeding with indigenous seed mix as soon as is practicable following excavation. This will reduce the flow velocity, treat potential pollutants, increase filtration and silt retention.

All stockpiled material will be side cast, battered back and profiled to reduce rainfall erosion potential. The stockpiling of materials will be carefully supervised as per the mitigation measures listed in Section 8.5.1 within Chapter 8, Land, Soils and Geology.

A number of ephemeral drainage features (drains) are also present on site. These appear dry except during dry weather. Culverting of these will only take place during dry weather periods. Culverts will be designed to be of a size adequate to carry expected peak flows. Culverts will be installed to conform, wherever possible, to the natural slope and alignment of the drainage line. Where required, culverts will be buried at an appropriate depth below the channel bed and the original bed material placed at the bottom of the culvert. The sizing of any new internal drainage crossings will maintain existing depth of flow and channel characteristics.

9.4.3.5 Grid Connection Route

Excavated material will not be stockpiled or side-cast within 10m of a watercourse. Appropriate steps will be taken to prevent soil/dirt generated during the grid connection route works from being transported on the public road. Road sweeping vehicles will be used to ensure that the public road network remains free of soil/dirt from the location of the grid connection when required. This will reduce the potential for sedimentation of surface watercourses locally.

Further mitigation measures will be incorporated in the CEMP in Appendix 3-2 of the EIAR.

There will be no natural watercourse crossings along the grid connection route.

9.4.3.6 Major Accidents/Disasters

As part of the requirements of the new EIA Directive, the applicant is requested to consider the "Expected Significant Adverse Effects of the project on the environment deriving from the vulnerability of the project to risks of major accidents and/or disasters which are relevant to the project concerned." As such, this section describes the expected significant effects on the environment arising from the vulnerability of the proposed development to risks of major accidents and/or natural disasters which are relevant to the project.

Due to the limited quantities of fuel on site, and 110% bunded fuel storage and appropriate chemical storage, the potential for a significant spillage of hydrocarbons is negligible and does not give risk to a major accident or disaster. Notwithstanding the negligible risk of serious spillage, additional spillage protection measures are included in the mitigation measures for the proposed development. In the unlikely event of a minor spill, the spill will be collected at the dedicated refuelling hardstand area, with collection only to be completed by trained operatives, and with spill kits to be made readily available. Additional measures in relation to hydrocarbon or oil spills are further discussed in Section 9.6.4. and mitigation measures in relation to potential contaminants are outlined in Section 9.5.

Due to the nature of Profile Park being an urban environment, in the unlikely event of a fire, there is no significant additional fire risk due to the separation distances from any fuel sources such as hydrocarbons and chemicals. In the event of substation infrastructure fire, there is minimal potential for fire spread due to the proposed design (i.e., hardstand areas) and to the firefighting protection system in place, which is based on the National Fire Protection Association (NFPA) standards.

The volumes of hydrocarbons and chemical storage will be kept to a minimum (as required), subject to a COSHH (Control of Substances Hazardous to Health) assessment and in compliance with the requirements of REACH, i.e., European Communities Regulation 1907/2006 for the Regulation, Evaluation, Authorisation and Restriction of Chemicals. Operators will receive specific training on the handling, containment, use, and disposal of all hazardous substances on site.

Baldonnell Stream is located within the site boundary. There are no streams in close proximity to the substation location. There is, therefore, no risk of significant impact on the surface water from substation fire.

It can be concluded that the risk of major accidents associated with this development and hydrological/hydrogeological factors is very low and would not cause unusual, significant or adverse effects on the hydrological or hydrogeological environment during the construction, operational and decommissioning phases.

9.4.4 Mitigation Measures – Operational Phase

The following mitigation measures will be implemented during the operational stage.

9.4.4.1 Hardstanding

The operational team will carry out maintenance works such as servicing of the infrastructure, upkeep of access, any hardstand and sealed areas (i.e., foundations for development buildings,

car park, bunded structures), ensuring drainage system remains functional throughout the operation of the development.

Mitigation for the operational maintenance works include regular scheduled maintenance works, regular inspections of all project elements with any unscheduled repairs or maintenance arising to be undertaken.

The potential impact of hydrocarbon or oil spills during the operational phase of the development are limited by the size of the fuel tank of vehicles used on the site. Mitigation measures for the potential release of hydrocarbons or oil spills include:

- The plant and vehicles to attend site should be regularly inspected or at least prior to the scheduled site visit to be free from leaks and fit for purpose;
- Fuels stored on site will be minimised, any storage areas will be bunded appropriately for the fuel storage volume for the time period of the operation;
- Operational team to be competent and trained in an emergency plan for the operation phase to deal with accidental spillages; and
- Spill kits will be available to deal with accidental spillages.

9.4.4.2 Hydrocarbon Fuel/ Oils

All fuel will be stored in bunded areas. The bund capacity will be sufficient to accommodate 110% of the largest tank's maximum. The exception to this being double walled tanks equipped with leak detection, which do not require additional retention.

It is proposed to discharge all the surface water to the soakaway but when the flow of water within the pipe exceeds the infiltration rate, excess water will be directed to the existing surface water infrastructure on the power plant site. Further treatment will be provided through the detention basin under the car parking and a petrol interceptor before discharging to the stream.. Regular bund testing will be undertaken in accordance with BAT guidance.

In order to comply with CRU requirements, low sulphur diesel oil will be stored as a backup fuel. The tanks will be bunded in accordance with the requirements set out in the EPA publication, 'Storage and Transfer of Materials for Scheduled Activities' (2004), which states bunds are to contain 110% of the volume of the tank in the event of a tank rupture.

9.4.4.3 Drainage

9.4.4.3.1 Surface Water Drainage

Surface water runoff will be generated from all surfaces within the facility that are exposed to rainwater or to which water is applied in order to clean. This includes all hardstanding surfaces, roofs, and other impermeable surfaces. All surface water will be discharged to the ground.

The drainage design is indicated on Planning Application Drawings 11069-2210. Surface water drainage calculations informing the drainage design are provided.

9.4.4.3.2 Foul Wastewater Drainage

Domestic type wastewater effluent will be generated on site. An approximate volume of $1m^3$/day of domestic type wastewater was identified as the maximum domestic wastewater flow which may be generated on site. Wastewater will be pumped to an existing holding tank which will be maintained, monitored and emptied to a licensed facility.

The drainage design is indicated on Planning Application Drawings 11069-2210 and 11069-2240. Foul Wastewater drainage calculations informing the drainage design are provided.

9.4.4.3.3 Process Wastewaters

There will be no process wastewater generated from the development.

9.4.4.4 Chemical Storage

Operators will receive specific training on the handling, containment, use, and disposal requirements for all potentially polluting products on site. All chemicals stored on site will be subject to a COSHH (Control of Substances Hazardous to Health) assessment and in compliance with the requirements of REACH, i.e., European Communities Regulation 1907/2006 for the Regulation, Evaluation, Authorisation and Restriction of Chemicals. Chemicals will be managed in accordance with European Chemicals Agency's Guidance for Downstream Users (2014). Final selection of bulk chemicals will be subject to an assessment of trace elements to ensure that they are within acceptable limits. In addition to this:

- All potentially polluting substances, including waste, will be stored in designated areas, in appropriate UN approved containers within bunds, drip trays, or spill pallets, as deemed necessary;
- All containers and bunds will be inspected regularly to ensure they have not become damaged or degraded;
- Hazardous compressor cleaning products will be segregated in a locked cabinet with limited access to prevent misuse. This cabinet will be made of suitably fire rated material;
- All areas on site with potentially polluting substances will be hardstanding with drainage networks directing run-off to contained areas;
- Accidental spillages will be contained and cleaned immediately by suitably trained personnel;
- Spill equipment stocks will be stored at strategic locations around the site. Stocks will be subject to regular inventory checks. Incidents, accidents, and near-misses will be recorded on site and notified to the appropriate authorities in accordance with licence requirements; and
- An Emergency Incident Response Plan will be developed and implemented in consultation with the local emergency services. This plan will include emergency response contact details for site personnel and emergency services, maps and plans of the facility, emergency procedures, chemical inventories, and equipment lists.

9.4.4.5 Firefighting Systems and Controls

A dedicated private fire ring main and hydrants, will be installed as part of the adjacent power station, that will serve the proposed substation. They will comply with IS 391:2020 Fire mains for buildings - Installation, commissioning, maintenance, and testing. A minimum of seven hydrants are being provided on the site, three of which are within close proximity of the proposed substation and on a route accessible by fire appliances. The hydrants will comply with the requirements of BS 750:2012 Specification for underground fire hydrants and surface box frames and covers. All hydrants will be conspicuously marked in accordance with BS 3251:1976 Specification of indicator plates for fire hydrants and emergency water supplies. The hydrants will be located such that they are not less than 6m or more than 46m from a building, and the distance from a hydrant to a vehicle access roadway or hard standing for fire appliances is not more than 30m.

A water storage tank will be provided on the power station site to ensure the security of the water supply for operational and firefighting needs. The tank shall serve both the ring main and hydrants. The latest calculations as provided to Irish Water, indicate that the water tank shall have a dedicated firefighting water storage capacity of circa 545m3, which will provide water at a rate of 75L/minute for 90 minutes.

9.4.5 Decommissioning Phase

In the event that the facility is decommissioned, the following programme will be implemented:

- All plant equipment and machinery will be emptied, dismantled, and stored under appropriate conditions until it can be sold. If a buyer cannot be found, the material will be recycled or disposed of through licensed waste contractors and hauliers. If plant and machinery is required to be cleaned on site prior to removal, all necessary measures will be implemented to prevent the release of contaminants;
- All waste will be removed from the facility;
- The site and all associated buildings will be secured; and
- Waste will be recycled wherever possible. Licensed waste contractors will control all waste movement, recycling, and disposal operations.

Details of provisions to decommission and render safe or remove all materials, waste, ground, plant, or equipment contained on or in the site that may result in environmental pollution will be agreed with the Environmental Protection Agency as part of the Industrial Emissions Licensing process.

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 in Section 9.4.3.

These impacts have therefore been assessed as similar to the construction phase. Mitigation measures for the construction phase will therefore also be implemented during decommissioning.

9.5 RESIDUAL EFFECTS

The potential residual impacts on the surrounding water quality, hydrology and existing drainage regime at the site are considered to be slight and temporary/short term in nature.

The construction timescale of activities within the site will be short-term in duration and, thereafter, the only activities occurring within the site will be associated with maintenance, such as maintaining the hardstanding and existing drains, ongoing maintenance, replacement of infrastructure and onsite infrastructure and monitoring during the operational phase. There are no significant long-term impacts.

The design of the proposed development has taken account of the potential impacts of the development and the risks to the surface water and groundwater environment. Measures have been developed to mitigate the potential effects on the water environment. These measures seek to avoid or minimise potential effects in the main through the implementation of best practice construction methods and adherence to all relevant legislation. Residual impacts are outlined in Table 0-9 to Table 9-11 below.

Table 9-8: Magnitude and Significance of Hydrological Criteria – construction (residual impacts)

Criteria	Duration and Frequency of Effects	Significance of Potential Effect
Runoff Regime	Short term and rarely	Not significant
Surface Water Quality	Temporary and occasional	Not significant
Groundwater Levels	Short term and rarely	Not significant
Groundwater Quality	Short term and occasional	Not significant

Potential residual impacts from the construction phase of the proposed development on the hydrological and hydrogeological environment are considered to be negative, short term and not significant.

Table 9-9: Magnitude and Significance of Hydrological Criteria – operational (residual impacts)

Criteria	Duration and Frequency of Effects	Significance of Potential Effect
Runoff Regime	Long term and rarely	Not significant
Surface Water Quality	Long term and rarely	Not significant
Groundwater Levels	Long term and rarely	Not significant
Groundwater Quality	Long term and rarely	Not significant

Potential residual impacts from the operational phase of the proposed development on the hydrological and hydrogeological environment are considered to be negative, of an unlikely probability, long term and not significant.

Table 9-10: Magnitude and Significance of Hydrological Criteria – Decommissioning (residual impacts)

Criteria	Duration and Frequency of Effects	Significance of Potential Effect
Runoff Regime	Short term and rarely	Not significant
Surface Water Quality	Temporary and occasional	Not significant
Groundwater Levels	Short term and rarely	Imperceptible
Groundwater Quality	Short term and occasional	Imperceptible

The decommissioning phase would have an unlikely and imperceptible impact for the high sensitivity watercourses.

9.6 CUMULATIVE IMPACTS

In terms of the potential impacts of developments on downstream surface water bodies, the biggest risk is during the construction phase of the development as this is the phase when earthworks and excavations will be undertaken at the sites.

Potential hydrological cumulative impacts arising from the proposed development and proposed grid connection are also not expected to be significant, due to the planned placement of the cables either within the one trench along existing roads or under the fence to the adjacent site, thereby reducing overall excavation requirements. Also, no in-stream works are required along the grid connection route.

A review of chapter 6 of this EIAR and relevant planning applications in terms of the 1.8 km zone of influence radius surrounding the proposed development site. Due to the small scale of development and a review of other projects and plan, there are no significant cumulative impacts.

The approved power plant project has potential hydrological and hydrogeological connectivity between the downstream sites and the site of the proposed development, and therefore there can be potential cumulative effects or interaction with both the construction, operation, and decommissioning phases of the development.

SD20A/0121 Ancillary site development works will include attenuation ponds, the installation and connection to the underground foul and storm water drainage network, and the installation of utility ducts and cables, which will include the drilling and laying of ducts and cables under Baldonnell stream. Other ancillary site development works will include hard and soft landscaping, lighting, fencing, signage, service road, entrance gate, sprinkler tank house (72sq.m), security hut (30sq.m), 150 no. car parking spaces, and 78 no. sheltered bicycle parking spaces. The development will be enclosed with landscaping to all frontages, including a wetland to the west.

SD16A/0087 Site enabling works will include the demolition of an existing vacant house and outbuildings (total floor area c.241sq.m), the diversion of Baldonnell stream, and the provision of below ground attenuation and associated landscape works on a site of c.9.4ha, located north of the Nangor Road and west of Kilcarberry Business Park.

Implementation of the proposed drainage mitigation will ensure there will be no cumulative significant adverse impacts on the water environment from the proposed development in combination with other data centre developments and non-data centre farm developments within a 10km radius in the Liffey and Dublin Bay catchment.

9.7 CONCLUSIONS

The residual impacts on the surrounding water quality, hydrology, hydrogeology and existing drainage regime at the site are considered to be not significant and mainly short term in nature.

Detailed mitigation measures have been provided with regard to the design, construction, maintenance and decommissioning of the proposed development. The surface water drainage plan will be the principal means of significantly reducing sediment runoff arising from construction activities, and to control runoff rates. The key surface water control measure is that there will be no direct discharge of proposed development runoff into local watercourses.

In summary, the available information indicates that the proposed development presents no significant long-term impact on water quality, hydrology and hydrogeology, provided that the works are designed, constructed, maintained and decommissioned in accordance with the mitigation measures outlined in this chapter.

No significant cumulative impacts on any of the regional surface water catchments or groundwater bodies are anticipated from the proposed development and associated grid connection.

9.8 GLOSSARY

Aquifer A subsurface layer of layers of rock or other geological strata of sufficient porosity and permeability to allow either a significant flow of groundwater or the abstraction of significant quantities of groundwater [Water Framework Directive (2000/60/EC)].

Hydraulic conductivity [m/d] is an expression of the rate of flow of a given fluid through unit area and thickness of the medium, under unit differential pressure at a given temperature. In subsoils, intergranular permeability dominates, whilst in rock, fissure permeability (via fractures and bedding discontinuities) dominates in limestone bedrock in Ireland.

10.0 AIR QUALITY AND CLIMATE

10.1 INTRODUCTION

This chapter evaluates the impacts which the proposed development may have on Air Quality & Climate as defined in the Environmental Protection Agency (EPA) document Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA, 2022b) and Draft Advice Notes for Preparing Environmental Impact Statements (EPA, 2015).

10.1.1 Statement of Competency

This chapter of the EIAR has been prepared by the following staff of AWN Consulting Ltd:

Niamh Nolan is an environmental consultant in the air quality section of AWN Consulting Ltd. She holds a BSocSci (Hons) in Social Policy and Geography from University College Dublin. She is an Associate Member of both the Institute of Air Quality Management and the Institution of Environmental Science. She has experience in mapping software primarily in QGIS and she specialises in the area of air quality, climate and sustainability.

Dr. Jovanna Arndt (Senior Air Quality Consultant) holds a BSc (Hons) in Environmental Science, a PhD in Atmospheric Chemistry and is a member of the Institute of Air Quality Management. Jovanna has specialised in air quality since 2010 and has extensive knowledge of air dispersion modelling of a variety of infrastructure projects, including power stations, and is experienced in monitoring and managing the associated air quality impacts.

10.2 METHODOLOGY

10.2.1 Criteria for Rating of Impacts

10.2.1.1 Ambient Air Quality Standards

In order to reduce the risk to health from poor air quality, National and European statutory bodies have set limit values in ambient air for a range of air pollutants. These limit values or "Air Quality Standards" are health or environmental-based levels for which additional factors may be considered. For example, natural background levels, environmental conditions and socio-economic factors may all play a part in the limit value which is set.

Air quality significance criteria are assessed on the basis of compliance with the appropriate standards or limit values. The applicable standards in Ireland include the Air Quality Standards Regulations 2022, which incorporate European Commission Directive 2008/50/EC which has set limit values for a number of pollutants with the limit values for NO_2, PM_{10} and $PM_{2.5}$ being relevant to this assessment (see Table 10.1). Council Directive 2008/50/EC combines the previous Air Quality Framework Directive (96/62/EC) and its subsequent daughter directives (including 1999/30/EC and 2000/69/EC).

Table 10-1: Air Quality Standards 2011 (Based on Directive 2008/50/EC)

Pollutant	Regulation Note 1	Limit Type	Value
Particulate Matter (as PM_{10})	2008/50/EC	24-hour limit for protection of human health – not to be exceeded more than 35 times/year	50 µg/m^3 PM_{10}
		Annual limit for protection of human health	40 µg/m^3 PM_{10}
Particulate Matter (as $PM_{2.5}$)	2008/50/EC	Annual limit for protection of human health	25 µg/m^3 $PM_{2.5}$
Dust Deposition	TA Luft (German VDI 2002)	Annual average limit for nuisance dust	350 mg/m^2/day

Note 1 EU 2008/50/EC – Clean Air For Europe (CAFÉ) Directive replaces the previous Air Framework Directive (1996/30/EC) and daughter directives 1999/30/EC and 2000/69/EC.

10.2.1.2 Dust Deposition Guidelines

The concern from a health perspective is focused on particles of dust which are less than 10 microns and the EU ambient air quality standards outlined in Section 10.2.1.1 have set ambient air quality limit values for PM_{10} and $PM_{2.5}$.

With regard to larger dust particles that can give rise to nuisance dust, there are no statutory guidelines regarding the maximum dust deposition levels that may be generated during the construction phase of a development in Ireland.

However, guidelines for dust deposition, the German TA-Luft standard for dust deposition (non-hazardous dust) (German VDI, 2002) sets a maximum permissible emission level for dust deposition of 350 mg/m^2/day averaged over a one-year period at any receptors outside the site boundary. The TA-Luft standard has been applied for the purpose of this assessment based on recommendations from the EPA in Ireland in the document titled 'Environmental Management Guidelines - Environmental Management in the Extractive Industry (Non-Scheduled Minerals) (EPA, 2006). The document recommends that the Bergerhoff limit of 350 mg/m^2/day be applied to the site boundary of quarries. This limit value can be implemented with regard to dust impacts from construction of the proposed development.

10.2.1.3 Climate Agreements & Policies

In 2015, the Climate Action and Low Carbon Development Act 2015 (No. 46 of 2015) (Government of Ireland, 2015) was enacted (the Act). The purpose of the Act was to enable Ireland '*to pursue, and achieve, the transition to a low carbon, climate resilient and environmentally sustainable economy by the end of the year 2050'*(3.(1) of No. 46 of 2015). This is referred to in the Act as the 'national transition objective'. The Act provided for the establishment of the Climate Change Advisory Council (hereafter referred to as the Advisory Council) with the function to advise and make recommendations on the preparation of the national mitigation and adaptation plans and compliance with existing climate obligations. The Advisory Council is to advise and make recommendations on the following:

- The preparation of a Climate Action Plan (CAP);
- The preparation of a national long term climate action strategy;
- The preparation of a national adaptation framework;
- The finalization and revision of a carbon budget, and

- Compliance with any existing obligations of the State under EU law or any international agreements.

The first Climate Action Plan (CAP) was published by the Irish Government in June 2019 (Government of Ireland, 2019). The Climate Action Plan 2019 outlined the current status across key sectors including Electricity, Transport, Built Environment, Industry and Agriculture and outlined the various broadscale measures required for each sector to achieve ambitious decarbonisation targets. The 2019 CAP also detailed the required governance arrangements for implementation including carbon-proofing of policies, establishment of carbon budgets, a strengthened Climate Change Advisory Council and greater accountability to the Oireachtas. The Government published the second Climate Action Plan in November 2021 (Government of Ireland, 2021a) and a third update in December 2022 (Government of Ireland, 2022).

Following on from Ireland declaring a climate and biodiversity emergency in May 2019, and the European Parliament approving a resolution declaring a climate and environment emergency in Europe in November 2019, the Government approved the publication of the General Scheme in December 2019, followed by the publication of the Climate Action and Low Carbon Development (Amendment) Bill 2021 (hereafter referred to as the 2021 Climate Bill) in March 2021. The Climate Act was signed into Law on the 23rd of July 2021, giving statutory effect to the core objectives stated within the CAP.

The purpose of the 2021 Climate Act was to provide for the approval of plans 'for the purpose of pursuing the transition to a climate resilient, biodiversity rich and climate neutral economy by no later than the end of the year 2050'. The 2021 Climate Act will also 'provide for carbon budgets and a sectoral emissions ceiling to apply to different sectors of the economy'. The 2021 Climate Act removes any reference to a national mitigation plan and instead refers to both the CAP, as published in 2019, and a series of National Long Term Climate Action Strategies. In addition, the Minister for the Environment, Climate and Communications is required to request that each local authority prepare a 'local authority climate action plan' lasting five years and specifying the mitigation measures and the adaptation measures to be adopted by the local authority. The 2021 Climate Act has set a target of a 51% reduction in the total amount of GHGs over the course of the first two carbon periods ending 31 December 2030 relative to 2018 annual emissions. The 2021 Climate Act defines the carbon budget as 'the total amount of GHG emissions that are permitted during the budget period'. The 2021 Climate Act outlined a series of specific actions including:

- To make a strategy to be known as the 'National Long Term Climate Strategy' not less than once in every five-year period with the first to be published for the period 2021 to 2035 and with each subsequent Strategy covering the next three five-year carbon budgets and also include a longer-term perspective of at least 30 years;
- To adopt a system of carbon budgets which will be determined as part of a grouping of three five-year periods calculated on an economy-wide basis, starting with the periods 2021 to 2025, 2026 to 2030, and 2031 to 2035 (See Table 10 2);
- To introduce a requirement for Government to adopt "sectoral emission ceilings" for each relevant sector within the limits of each carbon budget;
- To request all local authorities to prepare CAPs for the purpose of contributing to the national climate objective. These plans should contain mitigation and adaptation measures that the local authority intends to adopt;
- Increasing the power of the Advisory Council to recommend the appropriate climate budget and policies;
- Requiring the Minister to set out a roadmap of actions to include sector specific actions that are required to comply with the carbon budget and sectoral emissions ceiling for the period to which the plan relates; and

- Reporting progress with the CAP on an annual basis with progress including policies, mitigation measures and adaptation measures that have been adopted.

In relation to carbon budgets, the Climate Action and Low Carbon Development (Amendment) Act (Government of Ireland, 2021b) states 'A carbon budget, consistent with furthering the achievement of the national climate objective, shall be proposed by the Climate Change Advisory Council, finalised by the Minister and approved by the Government for the period of 5 years commencing on the 1 January 2021 and ending on 31 December 2025 and for each subsequent period of 5 years (in this Act referred to as a 'budget period')'. The carbon budget is to be produced for 3 sequential budget periods, as shown in Table 10 2. The carbon budget can be revised where new obligations are imposed under the law of the European Union or international agreements or where there are significant developments in scientific knowledge in relation to climate change. In relation to the sectoral emissions ceiling, the Minister for the Environment, Climate and Communications (the Minister for the Environment) shall prepare and submit to government the maximum amount of GHG emissions that are permitted in different sectors of the economy during a budget period and different ceilings may apply to different sectors. The sectorial emission ceilings for 2030 were published July in 2022 and are shown in Table 10 2.

Table 10-2: Year Carbon Budgets 2021-2025, 2026-2030 and 2031-2025 (Department of the Taoiseach, 2022)

Sector	Reduction Required	2018 Emissions ($MtCO_2e$) Note 1
2021-2025	295 Mt CO_2eq	Reduction in emissions of 4.8% per annum for the first budget period.
2026-2030	200 Mt CO_2eq	Reduction in emissions of 8.3% per annum for the second budget period.
2031-2035	151 Mt CO_2eq	Reduction in emissions of 3.5% per annum for the third provisional budget.

Note 1 Mt CO_2eq denotes million tonnes carbon dioxide equivalent.

Table 10-3: Sectoral Emission Ceiling 2030 (Department of the Taoiseach, 2022)

Sector	Reduction Required	2018 Emissions ($MtCO_2e$)	2030 Emission Ceiling ($MtCO_2e$)
Electricity	75%	10.5	3
Transport	50%	12	6
Buildings (Commercial and Public)	45%	2	1
Buildings (Residential)	40%	7	4
Industry	35%	7	4
Agriculture	25%	23	17.25
Other**	50%	2	1

In December 2022, CAP23 was published (Government of Ireland, 2022). This is the first CAP since the publication of the carbon budgets and sectoral emissions ceilings, and it aims to implement the required changes to achieve a 51% reduction in carbon emissions by 2030. The CAP has six vital high impact sectors where the biggest savings can be made: renewable energy,

energy efficiency of buildings, transport, sustainable farming, sustainable business and change of land-use.

The Dublin City Council Climate Change Action Plan published in 2019 (Dublin City Council and Codema, 2019) outlines a number of goals and plans to prepare for and adapt to climate change. There are five key action areas within the plan: energy and buildings, transport, flood resilience, nature-based solutions and resource management. Some of the measures promoted within the Action Plan under the 5 key areas involve building retrofits, energy master-planning, development of segregated cycle routes, the promotion of bike share schemes, development of flood resilient designs, promotion of the use of green infrastructure and water conservation initiatives. The implementation of these measures will enable the Dublin City Council area to adapt to climate change and will assist in bringing Ireland closer to achieving its climate related targets in future years. New developments need to be cognisant of the Action Plan and incorporate climate friendly designs and measures where possible.

10.2.2 Construction Phase

10.2.2.1 Air Quality

The Institute of Air Quality Management in the UK (IAQM) guidance document '*Guidance on the Assessment of Dust from Demolition and Construction*' (2014) outlines an assessment method for predicting the impact of dust emissions from demolition, earthworks, construction and haulage activities based on the scale and nature of the works and the sensitivity of the area to dust impacts. The IAQM methodology has been applied to the construction phase of this development in order to predict the likely risk of dust impacts in the absence of mitigation measures and to determine the level of site-specific mitigation required. The use of UK guidance is considered best practice in the absence of applicable Irish guidance.

Construction phase traffic also has the potential to impact air quality. The Transport Infrastructure Ireland (TII) guidance document *PE-ENV-01106 'Air Quality Assessment of Specified Infrastructure Projects'* (2022), states that road links meeting one or more of the following criteria can be defined as being 'affected' by a proposed development and should be included in the local air quality assessment. This approach is considered best practice and can be applied to any development that causes a change in traffic.

- Annual average daily traffic (AADT) changes by 1,000 or more;
- Heavy duty vehicle (HDV) AADT changes by 200 or more;
- A change in speed band;
- A change in carriageway alignment by 5m or greater.

The construction stage traffic has been reviewed against the above criteria to determine whether a detailed air quality assessment is required for the construction phase. It was determined that as the construction stage traffic does not meet any of the above criteria a detailed air quality assessment is not required as there is no potential for significant impacts to air quality from traffic emissions.

10.2.2.2 Climate

The impact of the construction phase of the Proposed Development on climate was determined by a qualitative assessment of the nature and scale of greenhouse gas generating construction activities associated with the Proposed Development.

10.2.3 Operational Phase

10.2.3.1 Air Quality

Operational phase traffic has the potential to impact air quality. The air quality assessment has been carried out following procedures described in the publications by the EPA (2015; 2022) and using the methodology outlined in the guidance documents published by TII (2022). This approach is considered best practice and can be applied to any development that causes a change in traffic.

The TII PE-ENV-01106 (2022) scoping criteria outlined in Section 10.2.2.1 was used to determine the road links required for inclusion in the modelling assessment. As none of the road links impacted by the proposed development met the scoping criteria a detailed assessment was scoped out as there is no potential for significant impacts to air quality from traffic emissions.

10.2.3.2 Climate

The impact of the operational phase of the development on climate was determined by a qualitative assessment of the nature and scale of greenhouse gas generating operational activities associated with the Proposed Development.

10.3 BASELINE ENVIRONMENT

10.3.1 Meteorological Data

A key factor in assessing temporal and spatial variations in air quality is the prevailing meteorological conditions. Depending on wind speed and direction, individual receptors may experience very significant variations in pollutant levels under the same source strength (i.e., traffic levels) (WHO, 2006). Wind is of key importance in dispersing air pollutants and for ground level sources, such as traffic emissions, pollutant concentrations are generally inversely related to wind speed. Thus, concentrations of pollutants derived from traffic sources will generally be greatest under very calm conditions and low wind speeds when the movement of air is restricted. In relation to PM_{10}, the situation is more complex due to the range of sources of this pollutant. Smaller particles (less than $PM_{2.5}$) from traffic sources will be dispersed more rapidly at higher wind speeds. However, fugitive emissions of coarse particles ($PM_{2.5}$ - PM_{10}) will actually increase at higher wind speeds. Thus, measured levels of PM_{10} will be a non-linear function of wind speed.

The nearest representative weather station collating detailed weather records is Casement Aerodrome meteorological station, which is located approximately 1.2 km south of the site. Casement Aerodrome met data has been examined to identify the prevailing wind direction and average wind speeds over a five-year period (see Figure 10-1). For data collated during five representative years (2017 - 2021), the predominant wind direction is westerly to south-westerly with a mean wind speed of 10.7 m/s over the period 1981 - 2010 (Met Éireann, 2023).

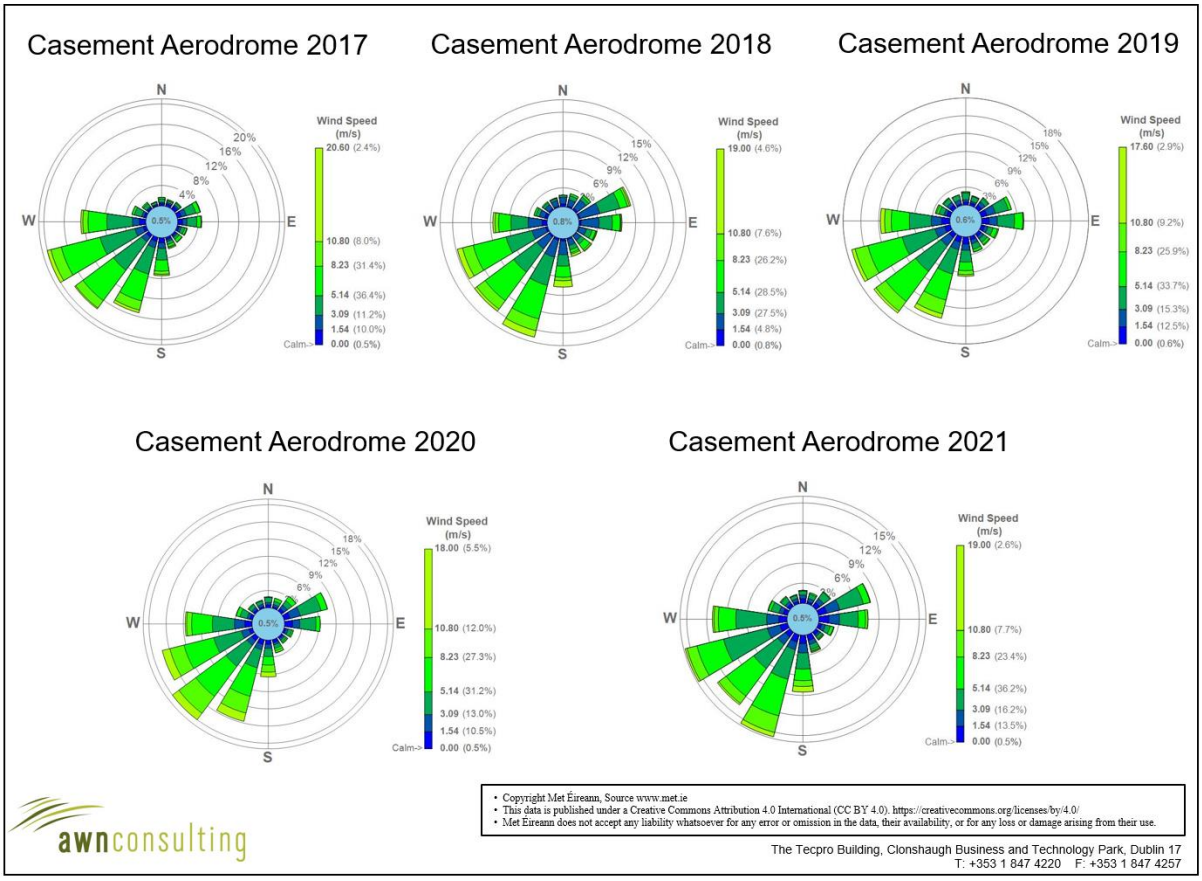

Figure 10-1: Casement Aerodrome Windrose 2017 – 2021 (Met Éireann, 2023)

10.3.2 Background Concentrations of Pollutants

Air quality monitoring programs have been undertaken in recent years by the EPA. The most recent annual report on air quality in Ireland is "*Air Quality In Ireland 2021*" (EPA, 2022a). The EPA website details the range and scope of monitoring undertaken throughout Ireland and provides both monitoring data and the results of previous air quality assessments.

As part of the implementation of the Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011), as amended, four air quality zones have been defined in Ireland for air quality management and assessment purposes (EPA, 2022a). Dublin is defined as Zone A and Cork as Zone B. Zone C is composed of 23 towns with a population of greater than 15,000. The remainder of the country, which represents rural Ireland but also includes all towns with a population of less than 15,000, is defined as Zone D.

In terms of air monitoring and assessment, the proposed development site is within Zone A (EPA, 2022a). The long-term monitoring data has been used to determine background concentrations for the key pollutants in the region of the proposed development. The background concentration accounts for all non-traffic derived emissions (e.g., natural sources, industry, home heating etc.).

In 2020 the EPA reported (EPA, 2022a) that Ireland was compliant with EU legal air quality limits at all locations, however this was largely due to the reduction in traffic due to Covid-19 restrictions. The EPA *Air Quality in Ireland 2020* report details the effect that the Covid-19 restrictions had on air monitoring stations, which included reductions of up to 50% at some monitoring stations which have traffic as a dominant source. 2020 concentrations are therefore predicted to be an exceptional year and not consistent with long-term trends. The EPA *Air*

Quality in Ireland 2021 report details a return to pre-COVID-19 traffic levels where monitoring stations had traffic as a dominant source and as such, is once again can be used to determine baseline levels of pollutants in the vicinity of the proposed development.

PM_{10}

Long-term PM_{10} monitoring was carried out at the suburban Zone A locations of Rathmines, Dún Laoghaire, Tallaght, Phoenix Park and Ballyfermot. Concentrations over the 2017 – 2022 period are below both the annual and daily limit values (EPA, 2022a). The average annual mean concentrations range from 9 – 16 µg/m^3 over the period 2017– 2022 (see Table 10.3). In addition, there were at most 9 exceedances (in Rathmines in 2019) of the daily limit value of 50 µg/m^3, albeit 35 exceedances are permitted per year. Based on the above information an estimated background concentration of 16 µg/m^3 has been used in this assessment.

Table 10-4: Trends In Zone A Air Quality – PM_{10} (µg/m^3)

Station	Averaging Period Note 1	Year				
		2017	2018	2019	2020	2021
Ballyfermot	Annual Mean PM_{10} (µg/m^3)	12	16	14	12	12
	24-hr Mean > 50 µg/m^3 (days)	1	0	7	2	0
Dún Laoghaire	Annual Mean PM_{10} (µg/m^3)	12	13	12	12	11
	24-hr Mean > 50 µg/m^3 (days)	2	0	2	0	0
Tallaght	Annual Mean PM_{10} (µg/m^3)	12	15	12	10	10
	24-hr Mean > 50 µg/m^3 (days)	2	1	3	0	0
Rathmines	Annual Mean PM_{10} (µg/m^3)	13	15	15	11	12
	24-hr Mean > 50 µg/m^3 (days)	5	2	9	2	0

Note 1: Data for 2020 shown for representative purposes only, not used in determining background concentrations.

$PM_{2.5}$

Annual mean concentrations of $PM_{2.5}$ monitoring at the Zone A location of Rathmines over the period 2017 – 2021 (EPA, 2022a) ranged from 8 - 10 µg/m^3 and indicated an average $PM_{2.5}/PM_{10}$ ratio ranging from 0.60 – 0.75. Based on this information, a conservative ratio of 0.8 was used to generate a background $PM_{2.5}$ concentration of 11.2 µg/m^3.

Based on the above information the air quality in the Dublin area is generally good, with concentrations of the key pollutants generally well below the relevant limit values. However, the EPA have indicated that road transport emissions are contributing to increased levels of NO_2, with the potential for breaches in the annual NO_2 limit value in future years at locations within urban centres and roadside locations. In addition, burning of solid fuels for home heating is contributing to increased levels of particulate matter (PM_{10} and $PM_{2.5}$). The EPA predict that exceedances in the particulate matter limit values are likely in future years if burning of solid fuels for residential heating continues (EPA, 2022a).

10.3.3 Sensitivity of the Receiving Environment

In line with the UK Institute of Air Quality Management (IAQM) guidance document 'Guidance on the Assessment of Dust from Demolition and Construction' (2014) prior to assessing the impact of dust from a proposed development the sensitivity of the area must first be assessed as outlined below. Both receptor sensitivity and proximity to proposed works areas are taken into consideration. For the purposes of this assessment, high sensitivity receptors are regarded as residential properties where people are likely to spend the majority of their time. Commercial properties and places of work are regarded as medium sensitivity while low sensitivity receptors are places where people are present for short periods or do not expect a high level of amenity.

In terms of receptor sensitivity to dust soiling, there are approximately 5 medium sensitivity commercial properties within 100 m of the main works area of the proposed development site. Based on the IAQM criteria outlined in Table 10-5, the worst-case sensitivity of the area to dust soiling is considered to be **low**.

Table 10-5: Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Number Of Receptors	Distance from source (m)			
		<20	<50	<100	<350
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	**Low**	Low	Low
Low	>1	Low	Low	Low	Low

In addition to sensitivity to dust soiling, the IAQM guidelines also outline the assessment criteria for determining the sensitivity of the area to human health impacts. The criteria take into consideration the current annual mean PM_{10} concentration, receptor sensitivity based on type (residential receptors are classified as high sensitivity) and the number of receptors affected within various distance bands from the construction works.

In terms of receptor sensitivity to human health impacts, the IAQM guidance defines high sensitivity receptors as "*locations where members of the public are exposed over a time period relevant to the air quality objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day)*" (IAQM, 2014). Examples include residential properties, schools and hospitals. Office and shop workers are considered of medium sensitivity. Low sensitivity receptors are areas where exposure is transient such as public footpaths and shopping streets.

A conservative estimate of the current annual mean PM_{10} concentration in the vicinity of the proposed development is 16 µg/m^3 and there are approximately 5 medium sensitivity receptors located within 50 m of the proposed development site. Based on the IAQM criteria outlined in Table 10-6, the worst-case sensitivity of the area to human health is considered to be **low**.

Table 10-6: Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM_{10} Concentration	Number Of Receptors	Distance from source (m)				
			<20	<50	<100	<200	<350
High	< 24 µg/m^3	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	< 24 µg/m^3	>10	Low	Low	Low	Low	Low
		1-10	Low	**Low**	Low	Low	Low
Low	< 24 µg/m^3	>1	Low	Low	Low	Low	Low

Ecological sites within 50 m of the proposed development site need to be considered in relation to dust impacts (IAQM, 2014). There are no designated ecological sites within 50m of the boundary of the site and as such the sensitivity of the area to dust related ecological impacts is not applicable.

10.3.4 Climate Baseline

Anthropogenic emissions of greenhouse gases in Ireland included in the EU 2020 strategy are outlined in the most recent review by the EPA which details final emissions up to 2019 (EPA, 2022c). The data published in 2021 states that Ireland has exceeded its 2019 annual limit set under the EU's Effort Sharing Decision (ESD), 406/2009/EC1 by an estimated 6.85 Mt. For 2019, total national greenhouse gas emissions are 59.78 million tonnes carbon dioxide equivalent (Mt CO_2eq) with 45.58 MtCO_2eq of emissions associated with the ESD sectors for which compliance with the EU targets must be met. Agriculture is the largest contributor in 2019 at 35.3% of the total, with the transport sector accounting for 20.3% of emissions of CO_2.

GHG emissions for 2020 are estimated to be 9.7% lower than those recorded in 2019. Emission reductions have been recorded in 7 of the last 11 years. However, compliance with the annual EU targets has not been met for five years in a row. Emissions from 2016 – 2020 exceeded the annual EU targets by 0.29 MtCO_2eq, 2.94 MtCO_2eq, 5.57 MtCO_2eq, 6.98 MtCO_2eq and 6.73 MtCO_2eq respectively. Agriculture is consistently the largest contributor to emissions with emissions from the transport and energy sectors being the second and third largest contributors respectively in recent years.

The EPA 2021 GHG Emissions Projections Report for 2020 – 2040 (EPA, 2021) notes that there is a long-term projected decrease in greenhouse gas emissions as a result of inclusion of new climate mitigation policies and measures that formed part of the National Development Plan (NDP) which was published in 2018 and the Climate Action Plan published in 2019. Implementation of these are classed as a "*With Additional Measures scenario*" for future scenarios. A change from generating electricity using coal and peat to wind power and diesel vehicle engines to electric vehicle engines are envisaged under this scenario. While emissions are projected to decrease in these areas, emissions from agriculture are projected to grow steadily due to an increase in animal numbers. However, over the period 2013 to 2020 Ireland is projected to cumulatively exceed its compliance obligations with the EU's Effort Sharing Decision (Decision No. 406/2009/EC) 2020 targets by approximately 12.2MtCO_2eq under the "With Existing Measures" scenario and under the "With Additional Measures" scenario (EPA, 2021). The projections indicate that Ireland can meet its non-ETS EU targets over the period 2021 – 2030 assuming full implementation of the 2019 Climate Action Plan and the use of the flexibilities available.

10.4 POTENTIAL IMPACTS

10.4.1 Construction Phase

10.4.1.1 Air Quality

The construction phase has the potential to impact air quality through construction dust emissions. The following determines the potential dust impacts as a result of the proposed development. Section 10.6.1 determines the cumulative construction dust impacts as a result of the overlapping construction phases of the proposed development and other proposed and permitted developments within 350 m of the site.

In order to determine the level of dust mitigation required during the proposed works, the potential dust emission magnitude for each dust generating activity needs to be taken into account, in conjunction with the previously established sensitivity of the area (see Section 10.3.3). The major dust generating activities are divided into four types within the IAQM guidance to reflect their different potential impacts.

These are:

- Demolition;
- Earthworks;
- Construction; and
- Trackout (transport of dust from the construction site onto the public road network by movement of heavy vehicles).

Demolition

There is no scheduled demolition associated with the proposed development and as such has been scoped out of the analysis.

Earthworks

Earthworks primarily involve excavating material, loading and unloading of materials, tipping and stockpiling activities. Activities such as levelling the site and landscaping works are also considered under this category. The dust emission magnitude from earthworks can be classified as small, medium or large based on the definitions from the IAQM guidance as transcribed below:

- **Large:** Total site area > 10,000 m^2, potentially dusty soil type (e.g., clay which will be prone to suspension when dry due to small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds > 8 m in height, total material moved >100,000 tonnes;
- **Medium:** Total site area 2,500 m^2 – 10,000 m^2, moderately dusty soil type (e.g., silt), 5 - 10 heavy earth moving vehicles active at any one time, formation of bunds 4 – 8 m in height, total material moved 20,000 – 100,000 tonnes;
- **Small:** Total site area < 2,500 m^2, soil type with large grain size (e.g., sand), < 5 heavy earth moving vehicles active at any one time, formation of bunds < 4 m in height, total material moved < 20,000 tonnes, earthworks during wetter months.

Following the IAQM guidance (2014), the proposed earthworks can be classified as 'large'. As a worst case. When combining this with the previously established sensitivity of the area (Section 10.3.3) this results in an overall low risk of dust soiling impacts and a low risk of human health impacts as a result of earthworks activities (see Table 10-7).

Table 10-7: Risk of Dust Impacts - Earthworks

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Construction

Dust emission magnitude from construction can be classified as small, medium or large based on the definitions from the IAQM guidance as transcribed below:

- **Large:** Total building volume > 100,000 m^3, on-site concrete batching, sandblasting;
- **Medium:** Total building volume 25,000 m^3 – 100,000 m^3, potentially dusty construction material (e.g., concrete), on-site concrete batching;

- **Small:** Total building volume < 25,000 m^3, construction material with low potential for dust release (e.g., metal cladding or timber).

The dust emission magnitude from construction associated with the proposed works can be classified as 'large', as a worst-case estimate. Therefore, there is an overall low risk of dust soiling impacts and a low risk of human health impacts as a result of the proposed construction activities (Table 10-8).

Table 10-8: Risk of Dust Impacts – Construction

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Trackout

Factors which determine the dust emission magnitude are vehicle size, vehicle speed, number of vehicles, road surface material and duration of movement. Dust emission magnitude from trackout can be classified as small, medium or large based on the definitions from the IAQM guidance as transcribed below:

- **Large:** > 50 HGV (> 3.5 t) outward movements in any one day, potentially dusty surface material (e.g., high clay content), unpaved road length > 100 m;
- **Medium:** 10 - 50 HGV (> 3.5 t) outward movements in any one day, moderately dusty surface material (e.g., high clay content), unpaved road length 50 - 100 m;
- **Small:** < 10 HGV (> 3.5 t) outward movements in any one day, surface material with low potential for dust release, unpaved road length < 50 m.

The dust emission magnitude for the proposed trackout can be classified as 'large' as worst-case there will be greater than 50 outward HGV movements per day at peak times. As outlined in Table 10-9, combining this with a low sensitivity to dust soiling results in an overall low risk of impacts as a result of the proposed trackout activities in the absence of mitigation. There is an overall low risk of human health impacts as a result of trackout activities as the overall sensitivity of the area to human health impacts is low (Section 10.3.3).

Table 10-9: Risk of Dust Impacts – Trackout

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Summary of Dust Emission Risk

The risk of dust impacts as a result of the proposed development are summarised in Table 10-10 for each activity. The magnitude of risk determined is used to prescribe the level of site-specific mitigation required for each activity in order to prevent significant impacts occurring.

There is at most a low risk of dust impacts as a result of the proposed construction phase. Nevertheless, in order to ensure that no dust nuisance occurs during the earthworks, construction and trackout activities, best practice dust mitigation measures will be implemented. When the dust mitigation measures detailed in the mitigation section of this chapter (Section 10.5) are implemented, fugitive emissions of dust from the site will be insignificant and pose no nuisance at nearby receptors. In the absence of mitigation, there is the potential for short-term, localised, imperceptible dust related impacts to air quality as a result of the proposed development.

Table 10-10: Summary of Dust Impact Risk used to Define Site-Specific Mitigation

Potential Impact	Dust Emission Magnitude			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	N/A	Low Risk	Low Risk	Low Risk
Human Health	N/A	Low Risk	Low Risk	Low Risk

There is also the potential for traffic emissions to impact air quality in the short-term over the construction phase. Particularly due to the increase in HGVs accessing the site. The construction stage traffic has been reviewed and a detailed air quality assessment has been scoped out as none of the road links impacted by the proposed development satisfy the TII REM assessment criteria in Section 10.2.2.1.

It can therefore be determined that the construction stage traffic will have an imperceptible, direct, neutral and short-term impact on air quality.

Impacts during the decommissioning phase are expected to be of similar type and magnitude to those anticipated during the construction phase, but generally of a shorter duration. During decommissioning an assessment of any changes to receptor sensitivity or dust emission magnitude will be considered.

10.4.1.2 Human Health

Dust emissions from the construction phase of the proposed development have the potential to impact human health through the release of PM_{10} and $PM_{2.5}$ emissions. As per section 10.3.3 the surrounding area is of low sensitivity to dust related human health impacts. It was determined that there is an overall low risk of dust related human health impacts as a result of the construction phase of the proposed development. Therefore, in the absence of mitigation there is the potential for imperceptible, direct, neutral, short-term impacts to human health as a result of the proposed development.

10.4.1.3 Sensitive Ecosystems

There are no sensitive ecosystems within 50 m of the proposed development during the construction phase. Therefore, there is no potential for significant impacts to sensitive ecosystems as a result of the proposed development.

10.4.1.4 Climate

There is the potential for a number of greenhouse gas emissions to atmosphere during the construction of the development. Construction vehicles, generators etc., may give rise to CO_2 and N_2O emissions. The Institute of Air Quality Management document *Guidance on the Assessment of Dust from Demolition and Construction* (IAQM, 2014) states that site traffic and plant is unlikely to make a significant impact on climate. Therefore, in accordance with the EPA Guidelines, the impact will be short-term, neutral and imperceptible.

10.4.2 Operational Phase

10.4.2.1 Air Quality

There is the potential for a number of emissions to the atmosphere during the operational phase of the development. In particular, the traffic-related air emissions may generate quantities of air pollutants such as NO_2, PM_{10} and $PM_{2.5}$.

Traffic flow information provided by the project traffic consultant (see Chapter 15 Traffic and Transportation) obtained from the consulting engineers on this project, was reviewed prior to assessing the impact of the proposed development. It was concluded that further assessment of impacts from the aforementioned pollutant emissions can be screened out using the TII PE-ENV-01106 (2022) guidance.

The proposed development will not increase traffic levels by more than the scoping criteria (see Section 10.2.2.1), therefore, an assessment of the impact of traffic emissions during the operational phase on ambient air quality is not necessary as no significant impacts are likely. The traffic data included the proposed development in addition to other permitted developments in the vicinity of the site where such information was available. It can be concluded that the impact of the proposed development in terms of air quality is long-term, localised, direct, neutral and imperceptible.

10.4.2.2 Human Health

Traffic related air emissions have the potential to impact air quality which can affect human health. The proposed development will not increase traffic levels by more than the scoping criteria (see Section 10.2.2.1), therefore, an assessment of the impact of traffic emissions during the operational phase on human health is not necessary as no significant impacts are likely. Levels of all pollutants are predicted to be below the ambient air quality standards set for the protection of human health (Table 10.1) once the proposed development is operational. It can be determined that the impact to human health during the operational stage is long-term, direct, neutral and imperceptible.

10.4.2.3 Sensitive Ecosystems

Traffic related air emissions have the potential to impact air quality which can affect sensitive ecosystems. The proposed development will not increase traffic levels by more than the scoping criteria (see Section 10.2.2.1), therefore, an assessment of the impact of traffic emissions during the operational phase on sensitive ecosystems is not necessary as no significant impacts are likely.

10.4.2.4 Climate

There are no potential impacts associated with the proposed development during the operational stage as the transmission line will be buried underground. It can be determined that the impact to climate during the operational stage is long-term, neutral and imperceptible.

10.5 MITIGATION MEASURES

10.5.1 Construction Phase

The pro-active control of fugitive dust will ensure the prevention of significant emissions, rather than an inefficient attempt to control them once they have been released. The main contractor will be responsible for the coordination, implementation and ongoing monitoring of the dust mitigation measures. The key aspects of controlling dust are listed below. Full details of the dust mitigation measures can be found in Section 10.10. These measures will be incorporated into the Construction Environmental Management Plan (CEMP) prepared for the site.

In summary the measures which will be implemented will include:

- Hard surface roads will be swept to remove mud and aggregate materials from their surface while any un-surfaced roads will be restricted to essential site traffic.
- Any road that has the potential to give rise to fugitive dust must be regularly watered, as appropriate, during dry and/or windy conditions.
- Vehicles exiting the site shall make use of a wheel wash facility where appropriate, prior to entering onto public roads.
- Vehicles using site roads will have their speed restricted, and this speed restriction must be enforced rigidly. On any un-surfaced site road, this will be 20 kph.
- Public roads outside the site will be regularly inspected for cleanliness and cleaned as necessary.
- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods.
- During movement of materials both on and off-site, trucks will be stringently covered with tarpaulin at all times. Before entrance onto public roads, trucks will be adequately inspected to ensure no potential for dust emissions.

At all times, these procedures will be strictly monitored and assessed. In the event of dust nuisance occurring outside the site boundary, movements of materials likely to raise dust will be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations.

10.5.2 Operational Phase

There are no mitigation measures proposed for the operational phase of the proposed development.

10.6 CUMULATIVE IMPACTS

10.6.1 Construction Phase

According to the IAQM guidance (2014) should the construction phase of the proposed development coincide with the construction phase of any other development within 350m then there is the potential for cumulative construction dust impacts. Permitted and existing

developments under construction within 350m of the site have been reviewed in conjunction with the impacts of the proposed development to determine the potential for cumulative construction dust impacts.

There are a number of developments within 350 m of the site that have the potential for cumulative construction dust impacts to air quality. Should the construction phases of any development coincide with that of the proposed development then there is the potential for cumulative construction dust impacts to nearby receptors.

However, provided the mitigation measures outlined in Section 10.5 are in place for the duration of the construction phase cumulative dust related impacts to nearby sensitive receptors are not predicted to be significant. Cumulative impacts to air quality will be direct, short-term, localised, negative and imperceptible.

Due to the short-term duration of the construction phase and the low potential for significant CO_2 and N_2O emissions cumulative impacts to climate are considered neutral.

10.6.2 Operational Stage

There are no operational emissions from the proposed development, therefore the cumulative impact is predicted to be long-term, neutral and imperceptible in relation to air quality.

10.7 RESIDUAL IMPACTS

10.7.1 Construction Stage

10.7.1.1 Air Quality

In order to minimise dust emissions during construction, a series of mitigation measures have been prepared (Section 10.10). Provided the dust minimisation measures outlined are adhered to, the predicted residual air quality impacts during the construction phase are direct, short-term, negative, localised and imperceptible.

10.7.1.2 Human Health

The measures outlined in Section 10.5 are best practice mitigation measures. They are proposed for the construction phase of the proposed development, which will focus on the proactive control of dust and other air pollutants to minimise generation of emissions at source. The mitigation measures that will be put in place during construction of the proposed development will ensure that the impact complies with all EU ambient air quality legislative limit values which are based on the protection of human health. Therefore, the predicted residual impact of construction of the proposed development is direct, negative, short-term and imperceptible with respect to human health.

10.7.2 Operational Stage

There are no operational emissions from the proposed development, therefore the impact on air quality, human health and climate is predicted to be long-term, neutral and imperceptible.

10.8 MONITORING

10.8.1 Construction Phase

There is a low risk of dust soiling and as such monitoring of construction dust deposition is not recommended. Once the mitigation measures outlined in Section 10.5 are implemented impacts are predicted to be imperceptible.

10.8.2 Operational Phase

There is no monitoring recommended for the operational phase of the development as impacts to air quality and climate are predicted to be imperceptible.

10.9 INTERACTIONS

An adverse impact due to air quality in either the construction or operational phase has the potential to cause human health and dust nuisance issues. The mitigation measures that will be put in place at the proposed development will ensure that the impact complies with all ambient air quality legislative limits and, therefore, that the predicted residual impact is short-term, negative and imperceptible during the construction phase, and long-term, neutral and imperceptible during the operational phase.

Interactions between air quality and traffic can be significant. With increased traffic movements and reduced engine efficiency, i.e., due to congestion, the emissions of vehicles increase. The impacts of the proposed development on air quality are assessed by reviewing the change in AADT on roads close to the site. In this assessment, the impact of the interactions between traffic and air quality during both construction and operational phases, are considered to be imperceptible.

With the appropriate mitigation measures to prevent fugitive dust emissions, it is predicted that there will be no significant interaction between air quality and land and soils.

10.10 SCHEDULE OF ENVIRONMENTAL COMMITMENTS

The objective of dust control at the site is to ensure that no significant nuisance occurs at nearby sensitive receptors. In order to develop a workable and transparent dust control strategy, the following management plan has been formulated by drawing on best practice guidance from Ireland, the UK (BRE, 2003; IAQM, 2014; The Scottish Office, 1996; UK ODPM, 2002) and the USA (USEPA, 1997).

Site Management

The aim is to ensure good site management by avoiding dust becoming airborne at source. This will be done through good design and effective control strategies.

At the construction planning stage, the siting of activities and storage piles will take note of the location of sensitive receptors (See Section 10.3.3) and prevailing wind directions in order to minimise the potential for significant dust nuisance (see Figure 10.1 for the windrose for Casement Aerodrome). As the prevailing wind is predominantly westerly to south-westerly, locating construction compounds and storage piles downwind of sensitive receptors will minimise the potential for dust nuisance to occur at sensitive receptors.

Good site management will include the ability to respond to adverse weather conditions by either restricting operations on-site or quickly implementing effective control measures before the potential for nuisance occurs. When rainfall is greater than 0.2mm/day, dust generation is generally suppressed (IAQM, 2014; UK ODPM, 2002). The potential for significant dust generation is also reliant on threshold wind speeds of greater than 10 m/s (19.4 knots) (at 7m above ground) to release loose material from storage piles and other exposed materials (USEPA, 1986). Particular care should be taken during periods of high winds (gales) as these are periods where the potential for significant dust emissions are highest. The prevailing meteorological conditions in the vicinity of the site are favourable in general for the suppression of dust for a significant period of the year. Nevertheless, there will be infrequent periods where care will be needed to ensure that dust nuisance does not occur. The following measures shall be taken in order to avoid dust nuisance occurring under unfavourable meteorological conditions:

- The Principal Contractor or equivalent must monitor the contractors' performance to ensure that the proposed mitigation measures are implemented and that dust impacts and nuisance are minimised;
- During working hours, dust control methods will be monitored as appropriate, depending on the prevailing meteorological conditions;
- The name and contact details of a person to contact regarding air quality and dust issues shall be displayed on the site boundary, this notice board should also include head/regional office contact details;
- It is recommended that community engagement be undertaken before works commence on site explaining the nature and duration of the works to local residents and businesses;
- A complaints register will be kept on site detailing all telephone calls and letters of complaint received in connection with dust nuisance or air quality concerns, together with details of any remedial actions carried out;
- It is the responsibility of the contractor at all times to demonstrate full compliance with the dust control conditions herein;
- At all times, the procedures put in place will be strictly monitored and assessed.

The dust minimisation measures shall be reviewed at regular intervals during the works to ensure the effectiveness of the procedures in place and to maintain the goal of minimisation of dust through the use of best practice and procedures. In the event of dust nuisance occurring outside the site boundary, site activities will be reviewed and satisfactory procedures implemented to rectify the problem. Specific dust control measures to be employed are described below.

Preparing and Maintaining the Site

- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
- Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
- Fully enclose specific operations where there is a high potential for dust production and the site is active for an extensive period.
- Avoid site runoff of water or mud.
- Keep site fencing, barriers and scaffolding clean using wet methods.
- Remove materials that have the potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.
- Cover, seed or fence stockpiles to prevent wind whipping.

Operating Vehicles / Machinery and Sustainable Travel

- Ensure all vehicles switch off engines when stationary - no idling vehicles.

- Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.
- Impose and signpost a maximum-speed-limit of 20 kph haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).
- Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.
- Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing)

Operations

- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g., suitable local exhaust ventilation systems.
- Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
- Use enclosed chutes and conveyors and covered skips.
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
- Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.

Waste Management

- Avoid bonfires and burning of waste materials.

Measures Specific to Earthworks

- Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.
- Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.
- Only remove the cover in small areas during work and not all at once.
- During dry and windy periods, and when there is a likelihood of dust nuisance, a bowser will operate to ensure moisture content is high enough to increase the stability of the soil and thus suppress dust.

Measures Specific to Construction

- Avoid scabbling (roughening of concrete surfaces) if possible.
- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
- Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.
- For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.

Measures Specific to Trackout

Site roads (particularly unpaved) can be a significant source of fugitive dust from construction sites if control measures are not in place. The most effective means of suppressing dust

emissions from unpaved roads is to apply speed restrictions. Studies show that these measures can have a control efficiency ranging from 25 to 80% (UK ODPM, 2002).

- A speed restriction of 20 km/hr will be applied as an effective control measure for dust for on-site vehicles.
- Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use. If sweeping using a road sweeper is not possible due to the nature of the surrounding area then a suitable smaller scale street cleaning vacuum will be used.
- Avoid dry sweeping of large areas.
- Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
- Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
- Record all inspections of haul routes and any subsequent action in a site log book.
- Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.
- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).
- Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.
- Access gates to be located at least 10 m from receptors where possible.

Summary of Dust Mitigation Measures

The pro-active control of fugitive dust will ensure that the prevention of significant emissions, rather than an inefficient attempt to control them once they have been released, will contribute towards the satisfactory performance of the contractor. The key features with respect to control of dust will be:

- The specification of a site policy on dust and the identification of the site management responsibilities for dust issues;
- The development of a documented system for managing site practices with regard to dust control;
- The development of a means by which the performance of the dust minimisation measures can be regularly monitored and assessed; and
- The specification of effective measures to deal with any complaints received.

10.11 REFERENCES

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11.0 NOISE AND VIBRATION

11.1 INTRODUCTION

This chapter of the Environmental Impact Assessment Report (EIAR) describes the assessment undertaken of the potential noise and vibration impact from the proposed Profile Park substation and grid connection project on local residential amenity and commercial properties. Electrical power will be exported from the power plant's main transformers through the proposed Baldonnell 110kV substation to the existing Barnakyle 110kV substation, which is operated by EirGrid and owned by ESB. The associated grid connection works will consist of underground cabling. A full description of the proposed project is provided in Chapter 3 – *Description of the Proposed Development.*

Some 16 no. noise assessment locations (see Table 11.9) have been identified that are representative of the nearest residential, commercial and amenity locations. The nearest occupied residential noise sensitive locations (NSL) are located some 400 m to the south of the site (i.e., R001) and some 450 m to the north east (i.e. R014). The closest amenity to the development is Grangecaslte Golf Course (i.e., R015) which is located to the east of the development lands.

Noise and vibration impact assessments for the nearest NSLs have been prepared for the construction and operational phase of the proposed development. To inform this assessment baseline noise levels have been measured in the vicinity of a number of NSLs surrounding the proposed development. Noise predictions to the nearest NSLs have been prepared for both the construction and operational phases.

Other developments in the area (operational or permitted) with the potential for cumulative impacts were identified and included in this assessment. Further details on all the developments considered for cumulative impacts are provided in Chapter 6 of this EIAR (Planning Policy).

For a glossary of terms used in this chapter please refer to Appendix 11-1.

11.1.1 Statement of Authority

This chapter of the EIAR has been prepared by the following staff of AWN Consulting Ltd:

Damian Kelly (Technical Director) holds a B.Sc. from DCU and a M.Sc. from QUB. He has some 25 years' experience as an acoustic consultant and is a Member of the Institute of Acoustics. He has extensive knowledge in the field of noise modelling and prediction, having developed many of the largest and most complex examples of proprietary noise models prepared in Ireland to date. He has extensive modelling experience in relation to wind farm, industrial and road infrastructure projects. He is a sitting member of the committee of the Irish Branch of the Institute of Acoustics.

11.1.2 Fundamentals of Acoustics

A sound wave travelling through the air is a regular disturbance of the atmospheric pressure. These pressure fluctuations are detected by the human ear, producing the sensation of hearing. To take account of the enormous range of pressure levels that can be detected by the ear, it is widely accepted that sound levels are measured and expressed using a decibel scale i.e., a

logarithmic ratio of sound pressures. These values are expressed as Sound Pressure Levels (SPL) in decibels (dB).

The audible range of sounds expressed in terms of Sound Pressure Levels (SPL) is from 0 dB (for the threshold of hearing) to 120 dB (for the threshold of pain). In general, a subjective impression of doubling of loudness corresponds to a tenfold increase in sound energy which conveniently equates to a 10 dB increase in SPL. It should be noted that a doubling in sound energy (such as may be caused by a doubling of traffic flows) increases the SPL by 3 dB.

The frequency of sound is the rate at which a sound wave oscillates and is expressed in Hertz (Hz). The sensitivity of the human ear to different frequencies in the audible range is not uniform. For example, hearing sensitivity decreases markedly as frequency falls below 250Hz. In order to rank the SPL of various noise sources, the measured level has to be adjusted to give comparatively more weight to the frequencies that are readily detected by the human ear. The 'A-weighting' system defined in the international standard, BS ISO 226:2003 *Acoustics. Normal Equal-loudness Level Contours* has been found to provide the best correlations with human response to perceived loudness. SPLs measured using 'A-weighting' are expressed in terms of dB(A). An indication of the level of some common sounds on the dB(A) scale is presented in Figure 11-1.

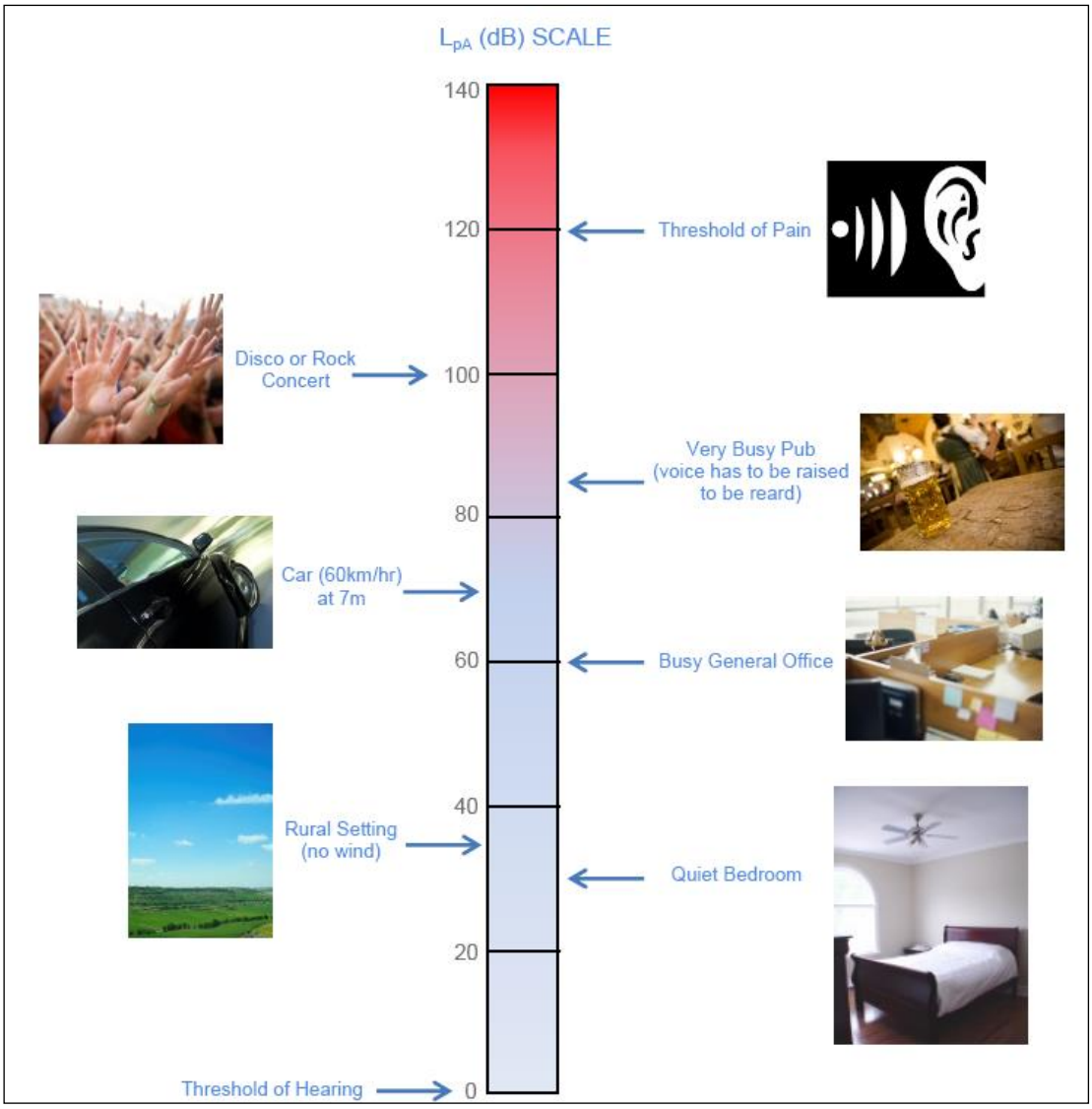


Figure 11-1: dB(A) Scale & Indicative Noise Levels – (EPA: Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4 – 2016))

11.2 METHODOLOGY

The assessment of impacts for the proposed development have been undertaken with reference to the most appropriate guidance documents relating to environmental noise and vibration which are set out in Section 11.2.3. In addition to these specific guidance documents, the following guidelines were considered and consulted for the purposes of this chapter:

- EPA Guidelines on the Information to be contained in Environmental Impact Statements, (EPA, 2022);
- EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports Draft August 2017 (EPA, 2017); and
- EPA Advice Notes for Preparing Environmental Impact Statements, (Draft, September 2015).

The assessment methodology undertaken for this assessment is summarised as follows:

- Review of the most applicable standards and guidelines to set acceptable noise and vibration criteria for the construction and operational phases of the proposed development;
- Characterise the receiving environment through baseline noise surveys at various NSLs surrounding the proposed development;
- Undertake predictive calculations to assess the potential impacts associated with the construction phase of the proposed development at NSLs;
- Undertake predictive calculations to assess the potential impacts associated with the operational phase of the proposed development at NSLs;
- Specify mitigation measures to reduce, where necessary, the identified potential outward impacts relating to noise and vibration from the proposed development; and,
- Describe the significance of the residual noise and vibration effects associated with the proposed development.

11.2.1 Guidance Documents and Assessment Criteria

The following sections review best practice guidance that is commonly adopted in relation to developments such as the one under consideration here.

11.2.1.1 Construction Phase Noise

There is no published statutory Irish guidance relating to the maximum permissible noise level that may be generated during the construction phase of a project. Local authorities normally control construction activities by imposing limits on the hours of operation and may consider noise limits at their discretion.

In the absence of specific noise limits, appropriate criteria relating to permissible construction noise levels for a development of this scale may be found in the British Standard BS 5228-1:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites – Noise*.

The approach adopted here calls for the designation of an NSL into a specific category (A, B or C) based on existing ambient noise levels in the absence of construction noise. A threshold noise value is applied to each category. Exceedances (construction noise only) of the threshold value, at the facade of a sensitive receptor during construction, indicates a potential significant noise impact associated with the construction activities. The threshold values recommended by *BS5228-1* are depicted in Table 11-1.

Table 11-1: Example Threshold Potential Significant Effect at Dwellings

Assessment category and threshold value period (T)	Threshold value, in $L_{Aeq,T}$ dB		
	Category A Note A	Category B Note B	Category C Note C
Night-time (23:00 to 07:00hrs)	45	50	55
Evenings and weekends Note D	55	60	65
Daytime (07:00 – 19:00hrs) and Saturdays (07:00 – 13:00hrs)	65	70	75

Note A Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are less than these values.

Note B	Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are the same as category A values.
Note C	Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are higher than category A values.
Note D	19:00 – 23:00 weekdays, 13:00 – 23:00 Saturdays and 07:00 – 23:00 Sundays.

It should be noted that this assessment method is only valid for residential properties.

For the appropriate period (e.g., daytime) the ambient noise level is determined and rounded to the nearest 5 dB. Based on review of baseline noise monitoring to hand the relevant BS5228-1 threshold values at the various assessment locations are discussed in the relevant section of this report.

Guidance on the degree of significance is presented the UK document Design Manual for Roads and Bridges (2020) *LA 111 Sustainability & Environmental Appraisal. Noise and Vibration Rev 2*. The approach is as follows:

- to determine the threshold value for construction noise according to the method from BS5228 described above, and;
- to compare the predicted construction noise level with the existing noise levels and the threshold value according to the criteria in the Table 11.2 below.

Potentially this procedure is to be followed separately for each noise-sensitive location, however in this instance as the existing noise levels at all survey locations correspond to Category A according to Table 11-1 above, all noise-sensitive locations are considered together.

Similarly, for this proposed development the vast majority of construction works will take place within the 'Daytime' period, i.e., 07:00 – 19:00 on Mondays to Fridays and 07:00 – 13:00 on Saturdays.

The magnitude of the construction noise impact according the DMRB is mapped to the EPA significance terms as detailed in Table 11.2:

Table 11-2: Description of the magnitude of impacts. Adapted from DMRB Table 3.16

Predicted Construction Noise Level is	Magnitude of Impact (DMRB)	EPA Significance of Effect
Below or equal Baseline Noise Level	Negligible	Not Significant
Above Baseline and below or equal to threshold	Minor	Slight – Moderate
Above threshold and below or equal to threshold + 5dB	Moderate	Moderate – Significant
Above threshold + 5dB	Major	Significant – Very Significant

Taking the above into account, it is considered that the 70 dB $L_{Aeq,1hr}$ is a suitable criterion for daytime construction noise at residential and amenity noise-sensitive locations and 75 dB $L_{Aeq,1hr}$ at commercial locations.

11.2.1.2 Construction Phase Vibration

Vibration standards come in two varieties: those dealing with human comfort and those dealing with cosmetic or structural damage to buildings. With respect to this development, the range of relevant criteria used for building protection is expressed in terms of Peak Particle Velocity (PPV) in mm/s.

Guidance relevant to acceptable vibration within buildings is contained in the following documents:

- British Standard BS 7385 – *Evaluation and measurement for vibration in buildings – Part 2: Guide to damage levels from ground borne vibration (BSI, 1993);* and
- British Standard BS 5228-2:2009+A1:2014 – *Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration* (BSI, 2014).

BS 7385 states that there should typically be no cosmetic damage if transient vibration does not exceed 15 mm/s at low frequencies rising to 20 mm/s at 15 Hz and 50 mm/s at 40 Hz and above. These guidelines relate to relatively modern buildings and should be reduced to 50% or less for more critical buildings.

BS 5228 recommends that, for a soundly constructed residential property and similar structures that are generally in good repair, a threshold for minor or cosmetic (i.e., non-structural) damage should be taken as a peak particle velocity of 15 mm/s for transient vibration at frequencies below 15 Hz and 20 mm/s at frequencies above than 15 Hz. Below these vibration magnitudes minor damage is unlikely, although where there is existing damage these limits may be reduced by up to 50%. In addition, where continuous vibration is such that resonances are excited within structures the limits discussed above may need to be reduced by 50%.

The Transport Infrastructure Ireland (TII) publication *Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes (TII, 2014)* also contains information on the permissible construction vibration levels during the construction phase as shown in Table 11-3.

Table 11-3: Allowable Vibration at Sensitive Properties (TII, 2014)

Allowable vibration (in terms of peak particle velocity) at the closest part of sensitive property to the source of vibration, at a frequency of		
Less than 10 Hz	10 to 50 Hz	50 to 100 Hz (and above)
8 mm/s	12.5 mm/s	20 mm/s

Following review of the guidance documents set out above, the values in Table 11-3 are considered appropriate for this assessment as they provide more stringent vibration criteria.

11.2.1.3 Additional Vehicular Activity on Public Roads

There are no specific guidelines or limits relating to traffic related sources along the local or surrounding roads. Given that traffic from the development will make use of existing roads already carrying traffic volumes, it is appropriate to assess the calculated increase in traffic noise levels that will arise because of vehicular movements associated with the development.

For the assessment of potential noise impacts from construction related traffic along public roads and haul routes it is proposed to adopt guidance from *Design Manual for Roads and Bridges* (DMRB), Highways England, Transport Scotland, The Welsh Government and The Department of Infrastructure 2020.

Table 11-4, taken from Section 13.17 of DMRB presents guidance as to the likely impact associated with any change in the background noise level ($L_{Aeq,T}$) at a noise sensitive receiver as a result of construction traffic.

Section 3.19 of DMRB states that construction noise and construction traffic noise shall constitute a significant effect where it is determined that a major or moderate magnitude of impact will occur for a duration exceeding:

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

Table 11-4: Likely Impacts Associated with Change in Traffic Noise Level (Source: Table 3.17, DMRB, 2020).

Change in Sound Level (dB L_{A10})	Magnitude of Impact
<1.0	Negligible
1.0 – 2.9	Minor
3.0 – 4.9	Moderate
5+	Major

The guidance outlined in Table 11-4 will be used to assess the predicted increases in traffic levels on public roads associated with the proposed development and comment on the likely short-term impacts during the construction phase.

11.2.1.4 Operational Phase Noise

The relevant local authority, South Dublin County Council (SDCC), does not have any standard noise conditions listed in the *Dublin Agglomeration Environmental Noise Action Plan December 2018 – November 2023 – Volume 4: South Dublin County Council*. Therefore, consideration has been given to the following best practice and national guidance and a review of planning conditions recently applied to similar developments in the area.

11.2.1.4.1 EPA – NG4

In order to establish whether the noise sensitive locations in the vicinity of the site would be considered 'low background noise' areas as defined in the Environmental Protection Agency (EPA) publication Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4 2016) guidance, the noise levels measured during the environmental noise survey need to satisfy the following criteria:

- Arithmetic Average of L_{A90} During Daytime Period ≤40 dB L_{A90}, and;
- Arithmetic Average of L_{A90} During Evening Period ≤35 dB L_{A90}, and;
- Arithmetic Average of L_{A90} During Night-time Period ≤30 dB L_{A90}.

Determining Appropriate Noise Criteria

Table 11-5 outlines the noise emission limit criteria detailed in the NG4 document.

Table 11-5: NG4 Approach for Determining Appropriate Noise Criteria

Scenario	Daytime Noise Criterion, dB $L_{Ar,T}$ (07:00 to 19:00hrs)	Evening Noise Criterion, dB $L_{Ar,T}$ (19:00 to 23:00hrs)	Night Noise Criterion, dB $L_{Aeq,T}$ (23:00 to 07:00hrs)
Areas of Low Background Noise	45 dB	40 dB	35 dB
All Other Areas	55 dB	50 dB	45 dB

Based on a review of the noise data to hand in the vicinity of the development site, the noise sensitive locations in the vicinity of the site are not defined as areas of low background noise as per the NG4 guidance, As the proposed development will operate on a 24-hour basis, the potential impact during night-time periods governs this assessment. Therefore, a night-time criterion 45 dB $L_{Aeq,T}$ would be applied to normal operations of the site.

Note that if the proposed development were designed to this level, plant noise would be a clearly audible source of noise at number of noise sensitive locations in close proximity of the development. It would be expected that such levels would give rise to complaints at nearby noise sensitive locations.

Note the following statements from NG4:

> *"Where there may be a question as to the bona fides of the complaint or any residual dispute following an initial investigation, an objective assessment should be undertaken in accordance with the guidance set out in BS 4142: 2014: Methods for rating and assessing industrial and commercial sound.*
>
> *In situations where there are reasonable grounds for annoyance and/or licence limits are exceeded, prompt remedial action should be taken by the licensee and BAT should be used to resolve the problem and to minimise the noise impact."*

Therefore, while a site may be compliant with the EPA limits the above would infer that a BS 4142 assessment may still confirm the validity of a complaint. Therefore, consideration should also be given to this guidance.

11.2.1.4.2 BS 4142:2014

BS 4142:2014+A1:2019: *Methods for rating and assessing industrial and commercial sound* is the industry standard method for analysing building services plant sound emissions to residential receptors. BS 4142 describes methods for rating and assessing sound of an industrial and/or commercial nature. The methods described in this British Standard use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident. It should also be noted that the EPA NG4 document indicates that this assessment methodology should be used in the assessment of complaints associated with a site's operations. Whilst the current site will be licenced, based on the NG4 extracts referenced above in relation to complaints, the guidance contained in BS 4142 needs to be given due regard.

For an appropriate BS 4142 assessment it is necessary to compare the measured external background sound level (i.e., the $L_{A90,T}$ level measured in the absence of plant items) to the rating level ($L_{Ar,T}$) of the various plant items, when operational. Where sound emissions are found to be tonal, impulsive, intermittent or to have other sound characteristics that are readily distinctive against the residual acoustic environment, BS 4142 advises that penalties be applied to the specific level to arrive at the rating level.

The subjective method for applying a penalty for tonal sound characteristics outlined in BS 4142 recommends the application of a 2dB penalty for a tone which is just perceptible at the receptor, 4dB where it is clearly perceptible, and 6dB where it is highly perceptible. In relation to intermittency, BS 4142 recommends that If the intermittency is readily readily distinguishable against the residual acoustic environment, a penalty of 3 dB can be applied. The following definitions as discussed in BS 4142 as summarised below:

"ambient sound level, $L_{Aeq,T}$"	equivalent continuous A-weighted sound pressure level of the totally encompassing sound in a given situation at any given time, usually from many sources near and far, at the assessment location over a given time interval, T.
"residual sound level, $L_{Aeq,T}$"	equivalent continuous A-weighted sound pressure level of the residual sound (i.e., ambient sound remaining at the assessment location when the specific sound source is suppressed to such a degree that it does not contribute to the ambient sound) at the assessment location over a given time interval, T.
"specific sound level, $L_{Aeq,T}$"	equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, Tr.
"rating level, $L_{Ar,T}$"	specific sound level plus any adjustment for the characteristic features of the sound.
"background sound level, $L_{A90,T}$"	A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T, measured using time weighting F and quoted to the nearest whole number of decibels.

In order to establish an initial estimate of impact, BS 4142 states the following:

Obtain an initial estimate of the impact of the specific sound by subtracting the measured background sound level from the rating level, and consider the following.

a. *Typically, the greater this difference, the greater the magnitude of the impact.*

b. *A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.*

c. *A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.*

d. *The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.*

Adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact.

The assessment methodology described above (i.e., comparison of rated sound level to background sound level) is quoted in BS 4142 as representing a methodology to '*obtain an initial estimate*' of impact. It is important to note that BS 4142 also comments that '*Where the initial estimate of the impact needs to be modified due to the context, take all pertinent factors into consideration*'. BS 4142 provides a list of potential pertinent factors that can influence the '*initial estimate*'. The plant noise assessment conducted in the following sections has been carried out with consideration of the guidance contained in BS 4142 as summarised above.

Based on the noise monitoring summarised in Section 11.3, and considering the guidance contained in BS 4142 it would be considered that a suitable noise criterion for a development of this nature at residential locations would be the order of 37 to 39 dB(A). This would also need to consider any rating corrections that would be appropriate in relation to BS 4142.

11.2.1.4.3 Commercial Properties

A number of commercial / industrial properties are located in the vicinity of the site. In terms of noise missions from the site it is considered that an appropriate noise criterion at these locations is 55 dB $L_{Aeq,15min}$.

11.2.1.4.4 Golf Couse Boundary

The adjacent golf course would be considered noise-sensitive and it is recommended that noise limits associated with the operations of the Proposed Development would not exceed 55 dB $L_{Aeq,15min}$ along the common boundary between the two sites in order to protect the recreational amenity of the facility.

11.2.1.5 Assessment of Significance

The '*Guidelines for Environmental Noise Impact Assessment*' produced by the Institute of Environmental Management and Assessment (IEMA) (2014) have been referenced in order to categorise the potential effect of changes in the ambient noise levels during the operational phases of the proposed development.

The guidelines state that for any assessment, the potential significance should be determined by the assessor, based upon the specific evidence and likely subjective response to noise. Due to varying factors which effect human response to environmental noise (prevailing environment, noise characteristics, time periods, duration and level etc.) assigning a subjective response must take account of these factors.

The scale adopted in this assessment is shown in Table 11.6 below and is based on an example scale within the IEMA guidelines. The corresponding significance of impact presented in the '*Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*' (EPA, 2022) is also presented.

The criteria above reflect the key benchmarks that relate to human perception of sound. A change of 3 dB(A) is generally considered to be the smallest change in environmental noise that is perceptible to the human ear. A 10 dB(A) change in noise represents a doubling or halving of the noise level. The difference between the minimum perceptible change and the doubling or halving of the noise level is split to provide greater definition to the assessment of changes in noise level.

It is considered that the criteria specified in the above table provide a good indication as to the likely significance of changes on noise levels in this case and have been used to assess the impact of operational noise.

Table 11-6: Operational Noise Impact Scale

Noise Level Change dB(A)	Subjective Response	Impact Guidelines for Noise Impact Assessment Significance (Institute of Acoustics)	Impact Guidelines on the Information to be contained in EIA Report's (EPA)
0	No change	None	Imperceptible
0.1 – 2.9	Barely perceptible	Minor	Not Significant
3.0 – 4.9	Noticeable	Moderate	Slight, Moderate
5.0 – 9.9	Up to a doubling or halving of loudness	Substantial	Significant
10.0 or more	More than a doubling or halving of loudness	Major	Very Significant, Profound

11.2.1.6 Recommended Criteria

Following review of relevant guidance, the following noise criteria are proposed for the development:

Day to Day Operation (Residential) – 37 to 39 dB $L_{Aeq,15min}$

Day to Day Operation (Commercial) – 55 dB $L_{Aeq,15min}$

Day to Day Operation (Grange castle Golf Couse Boundary) – 55 dB $L_{Aeq,15min}$

Note plant noise emissions are to be designed such that they are not tonal and do not have impulsive characteristics at the nearest noise sensitive locations.

11.2.1.7 Operational Phase Vibration

It should be noted that the day-to-day operation of the Proposed Development will not give rise to any significant levels of vibration off site and therefore the associated impact is not significant.

11.2.1.8 Decommissioning Phase

In relation to the decommissioning phase, the criteria and limits outlined in the Construction Phase of the Proposed Project would be applicable as similar tools and equipment will be used.

11.2.2 EPA Description of Effects

The significance of effects of the proposed development shall be described in accordance with the EPA guidance document Guidelines on the information to be contained in Environmental Impact Assessment Reports, 2022. Details of the methodology for describing the significance of the effects are provided in Chapter 1 (Introduction).

The effects associated with the proposed development are described in the relevant sections of this chapter with respect to the EPA guidance and description of effects as set out in Chapter 1 (Introduction).

11.2.3 Assessment Methodology

The following guidance documents have been referenced to inform the assessment methodology; further details are presented where relevant in the various sections of this chapter.

11.2.3.1 Background Noise Survey

Baseline noise monitoring has been completed at a number of representative locations in the vicinity of the development and is reviewed here to inform a preliminary discussion of the existing noise environment.

11.2.3.1.1 Choice of Measurement Locations

Figure 11-2: Noise Monitoring Locations illustrates the approximate location of the noise monitoring locations being considered here.

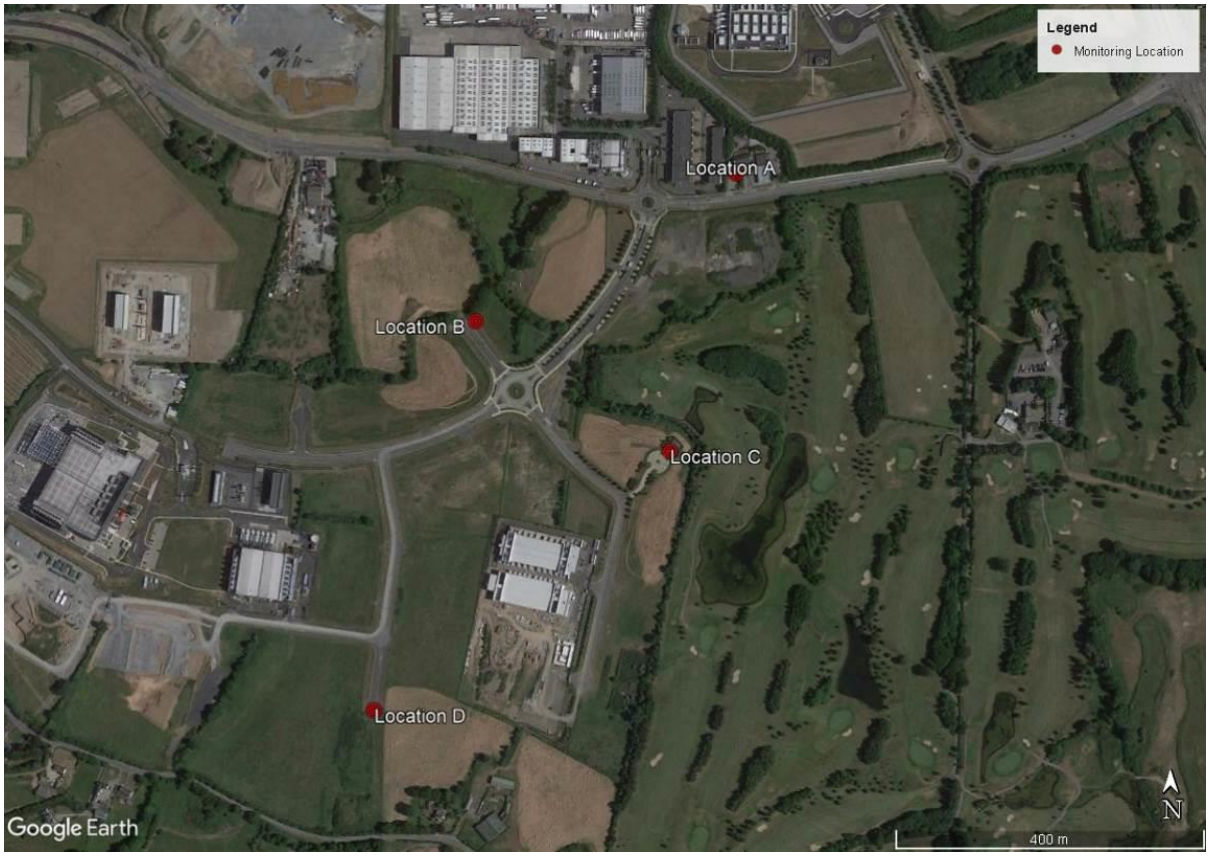


Figure 11-2: Noise Monitoring Locations

Location A Located to the north of the site in the vicinity of a number of dormer bungalows (R14) that are considered to be the closed noise sensitive residences to the north.

Location B Located to the north west of the site in the vicinity of R09.

Location C Located to the east of the site in the vicinity of the boundary with the Grangecastle golf course. This location would be considered to be representative of noise levels that would be experienced on the golf course itself.

Location D Located to the south of the site. The location would be considered to be representative of noise levels at Location R01 and background noise levels at properties along the Baldonnel Road (i.e. R02 to R05).

11.2.3.1.2 Measurement Periods

Noise measurements were conducted during typical day, evening and night-time periods. The night survey represents the time of night that provides a measure of existing background noise levels during a period where people are attempting to go to sleep or are sleeping. Due to the fact that the units in question here will operate on a 24-hour basis their potential impact during night-time periods is the critical issue. The survey was conducted during the following periods:

Surveys were completed during the following periods:

- Daytime 10:30 hrs to 14:25 hrs on 2 March 2021;
- Evening 21:34 hrs to 22:47 hrs on 2 March 2021, and;
- Night 22:53 hrs on 2 March 2021 to 01:21 hrs on 3 March 2021.

Weather conditions were dry and calm during all periods with temperatures of the order of 10°C during the daytime period, 5°C during the evening and 3°C during the night.

11.2.3.1.3 Instrumentation

A Brüel & Kjær Type 2250 Sound Level Meter (S/N 2818091) was used for all survey periods. Before, after and during each survey period, the measurement instrument was check calibrated using a Brüel & Kjær Type 4231 Sound Level Calibrator.

11.2.3.1.4 Measurement Procedure

Measurements were conducted at the locations noted above. Sample periods for the noise measurements were typically 15 minutes. The results were noted onto a Survey Record Sheet immediately following each sample and were also saved to the instrument memory for later analysis if required. Survey personnel noted the primary noise sources contributing to noise build-up.

11.2.3.2 Construction Noise Calculations

A variety of items of plant will be in use for the purposes of site preparation, construction and site works. There will be vehicular movements to and from the site that will make use of existing roads. There is the potential for generation of significant levels of noise from these activities.

Due to the nature of construction activities it is difficult to calculate the actual magnitude of emissions to the local environment in the absence of a detailed construction programme. The standard best practice approach is to predict typical noise levels at the nearest sensitive receptor using guidance set out in BS 5228-1:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites – Noise*. Construction noise predictions have been carried out using guidance set out in British Standard BS 5228-1:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites – Noise*.

The methodology adopted for the assessment of construction noise is to analyse the various elements of the construction phase in isolation. For each element, the typical construction noise sources are assessed along with typical sound pressure levels and spectra from BS 5228 at various distances from these works.

11.2.3.3 Operational Noise Calculations

There will be no noise emissions from the operation of the proposed underground grid connection during the day to day operation of the Proposed Development. Consequently, there is no requirement to assess any noise emissions associated with this aspect of the Proposed Development.

In terms of the proposed substation element of the Proposed Development a computer-based prediction model has been prepared to quantify the potential noise level associated with the operational phase of this aspect of the Proposed Development on the receiving environment.

This section discusses the methodology behind the noise modelling process and presents the results of the modelling exercise.

11.2.3.4 DGMR iNoise V2020 Enterprise

The selected software, DGMR *iNoise Enterprise*, calculates noise levels in accordance with ISO 9613: *Acoustics – Attenuation of sound outdoors, Part 2: General method of calculation*, (ISO, 1996).

iNoise is a proprietary noise calculation package for computing noise levels and propagation of noise sources. iNoise calculates noise levels in different ways depending on the selected prediction standard. In general, however, the resultant noise level is calculated considering a range of factors affecting the propagation of sound, including:

- the magnitude of the noise source in terms of A weighted sound power levels (L_WA);
- the distance between the source and receiver;
- the presence of obstacles such as screens or barriers in the propagation path;
- the presence of reflecting surfaces;
- the hardness of the ground between the source and receiver;
- Attenuation due to atmospheric absorption; and
- Meteorological effects such as wind gradient, temperature gradient and humidity (these have significant impact at distances greater than approximately 400 m).

11.2.3.5 Input Data and Assumptions

Buildings and information available for the site has been inputted into iNoise noise modelling software that implements *ISO 9613-2:1996 Acoustics – Attenuation of sound during propagation outdoors: General method of calculation*. The proposal in question considers the construction of a 6 no. gas turbine hall on the site as detailed in Chapter 2 of this EIAR (Description of the proposed development).

11.2.3.6 Noise Source Data

The noise modelling completed indicates the following limits in relation to various items of plant associated with the overall site development. Plant items will be selected in order to achieve the stated noise levels and or appropriate attenuation will be incorporated into the design of the plant/building in order that the plant noise emission levels are achieved on site and relevant criteria are not exceeded at noise sensitive locations.

Table 11-7presents the noise data assumed for the significant noise sources associated with the Proposed Development. Data has been supplied by Tobin Engineering unless otherwise stated.

Table 11-7: Summary of Noise Data for EIAR Noise Model

Item	Octave Band Sound Power Level dB L_w								dB	dB (A)
	63	125	250	500	1000	2000	4000	8000		
Transformer	79	81	82	81	77	71	79	68	88	84

The following extract from the "*EirGrid Evidence Based Environmental Studies Study 8: Noise – Literature review and evidence based field study on the noise effects of high voltage transmission development*" (May 2016) states the following in relation to noise impacts associated with 110KvA transformer installations:

> *"The survey on the 110kV substation at Dunfirth indicated that measured noise levels (LAeq) were less than 40dB(A) at 5m from each of the boundaries of the substation. This is below the WHO night-time free-field threshold limit of 42dB for preventing effects on sleep and well below the WHO daytime threshold limits for serious and moderate annoyance in outdoor living areas (i.e. 55dB and 50dB respectively). Spectral analysis of the data recorded at this site demonstrated that there were no distinct tonal elements to the recorded noise level. To avoid any noise impacts from 110kV substations at sensitive receptors, it is recommended that a minimum distance of 5m is maintained between 110kV substations and the land boundary of any noise sensitive property."*

Assuming the proposed substation installation has comparable noise emissions to the 110kV unit discussed above and considering the distance between the 110kV substation and the nearest off site locations (i.e. >220m) noise from this installation is not predicted to be an issue off site. The modelling presented here has been calibrated such that predicted levels are no greater than 45 dB(A) at 5m from each of the boundaries of the substation transformer.

11.2.3.6.1 Modelling Calculation Parameters

Prediction calculations for turbine noise have been conducted in accordance with ISO 9613: *Acoustics – Attenuation of sound outdoors, Part 2: General method of calculation*, 1996.

In terms of calculation a ground attenuation factor (general method) of 0.8 and no metrological correction were assumed for all calculations. The atmospheric attenuation outlined in Table 11-8 were used for all calculations.

Table 11-8: Atmospheric Attenuation Assumed for Noise Calculations (dB per km)

Temp (°C)	% Humidity	Octave Band Centre Frequencies (Hz)							
		63	125	250	500	1k	2k	4k	8k
10	70	0.12	0.41	1.04	1.93	3.66	9.66	32.77	116.88

Additional information relating to the noise model inputs and calculation settings is provided in Appendix 11-2.

11.2.3.7 Additional Information

The following noise sensitive locations have been considered as part of this assessment.

Figure 11-3: Noise Assessment Locations

Table 11-9: Assessment Locations

NSL Ref.	Description
R01	Two-storey residence to the south of the site on the north side of the Baldonnel Road. This location would be representative of residential accommodation associated with Baldonnel aerodrome on the opposite side of the road.
R02	A number of private residences located to the south west of the site along the southern side of the Baldonnel Road.
R03	
R04	
R05	
R06	Commercial property to the north east of the site.
R07	
R08	Derelict residence located to the north east of the site off the Nangor Road. It is assumed that this property will be demolished in due course and is not considered a noise sensitive residence in terms of this review.
R09	Residence located to the north east of the site. It is assumed that this property will be demolished in due course and is not considered a noise sensitive residence in terms of this review.
R10	Commercial buildings including office space located to the north on the opposite side of the Nagor Road.
R11	
R12	
R13	
R14	A row of dormer bungalows located to the north on the opposite side of the Nangor road beside a service station.
R15	Location representative of the Grangecastle Golf Course.
R16	Façade on nearest commercial building to the south of the proposed development.

11.3 EXISTING ENVIRONMENT

This section documents the typical background noise levels measured in the vicinity of the noise sensitive locations in closest proximity to the proposed development site. Table 11-10 presents the measured noise levels at Locations A, B, C and D.

Table 11-10: Noise Monitoring Results

Location	Period	Time	Sound Pressure Level (dB)	
			$L_{Aeq,15min}$	$L_{AF90,15min}$
A	Day	10:31 – 10:46	64	55
		11:52 – 12:07	63	50
		13:06 – 13:21	63	51
		Average	63	52
	Evening	21:34 – 21:49	58	42
	Night	22:55 – 23:10	59	41
		00:12 – 00:27	52	37
		Average	57	39
B	Day	10:53 – 11:08	54	52
		12:10 – 12:25	52	48
		13:49 – 14:04	51	47
		Average	52	49
	Evening	21:56 – 22:09	45	42
	Night	23:15 – 23:30	44	41
		00:31 – 00:46	42	40
		Average	43	40
C	Day	11:14 – 11:29	49	46
		12:29 – 12:44	48	45
		13:31 – 13:46	51	45
		Average	50	45
	Evening	22:14 – 22:29	42	40
	Night	23:32 – 23:47	42	39
		00:48 – 01:03	40	37
		Average	41	38
D	Day	11:32 – 11:47	46	45
		12:47 – 13:03	45	43
		14:07 – 14:23	45	42
		Average	45	43
	Evening	22:32 – 22:47	40	38
	Night	23:50 – 00:05	40	37
		01:06 – 01:21	40	37
		Average	40	37

Note 1 Average L_{Aeq} are logarithmic averages, Average L_{A90} values are arithmetic averages.

11.4 POTENTIAL EFFECTS

11.4.1 Do Nothing Effects

If the development is not progressed the existing noise environment will remain largely unchanged. Traffic noise is currently a significant noise source in the vicinity of road networks in the area. In the absence of the proposed development increases in traffic volumes on the local road network would be expected over time and would likely result in slight increases in the overall ambient and background noise levels in the area.

11.4.2 Potential Effects – Construction Phase

Construction noise prediction calculations have been conducted using the methodology outlined in Section 11.2.3.2. The noise levels referred to in this section are indicative only and are intended to demonstrate that it will be possible for the contractor to comply with current best practice guidance. The predicted "worst case" levels are expected to occur for only short periods of time at a very limited number of properties. Construction noise levels will be lower than these levels for most of the time at most properties in the vicinity of the proposed development.

11.4.2.1 General Construction

11.4.2.1.1 Noise

It is predicted that the construction programme will create typical construction activity related noise on site. During the construction phase of the proposed development, a variety of items of plant will be in use, such as excavators, lifting equipment, dumper trucks, compressors and generators.

The proposed general construction hours are 07:00 to 18:00hrs, Monday to Friday and 08:00 to 14:00hrs on Saturdays. Occasional weekday evening works may also be required; however evening activities will be significantly reduced in order to manage any associated noise impacts in an appropriate manner and more stringent construction noise criteria will be applicable during any evening works that may be required. As a result, noise emissions from evening activities are expected to be significantly lower than for other general daytime activities.

Due to the nature of daytime activities undertaken on a construction site of this nature, there is potential for generation of significant levels of noise. The flow of vehicular traffic to and from a construction site is also a potential source of relatively high noise levels. The potential for vibration at neighbouring sensitive locations during construction is typically limited to excavation works and lorry movements on uneven road surfaces. Due to the proximity of sensitive locations to site works however, there is little likelihood of structural or even cosmetic damage to existing neighbouring dwellings as a result of vibration.

Due to the fact that the construction programme has been established in outline form only, it is difficult to calculate the actual magnitude of noise emissions to the local environment. However, it is possible to predict typical noise levels using guidance set out in BS 5228-1. Table 11.11 outlines typical plant items and associated noise levels that are anticipated for various phases of the construction programme.

For the purposes of the assessment, we have assumed that standard good practice measures for the control of noise from construction sites will be implemented. These issues are commented upon in further detail in the mitigation section of this report.

Table 11-11: Typical Construction Noise Emission Levels

Phase	Item of Plant (BS 5228-1 Ref.)	Construction Noise Level at 10m Distance (dB $L_{Aeq,1hr}$)
1 – Site Preparation	Pneumatic Breaker (C5.6)	95
	Rock Breaker (C9.12)	85
	Wheeled Loader Lorry (C2 28)	74
	Tracked Semi-Mobile Crusher (C9.14)	90
	Track Excavator (C2 22)	72
	Dozer (C2.13)	78
	Dump Truck (C4.2)	78
2 – Foundations	Large Rotary Bored Piling Rig – Cast In-Situ (C3.14)	83
	Tracked Excavator (C3.24)	74
	Concrete Pump (C3.25)	78
	Compressor (C3 19)	75
	Poker Vibrator (C4 33)	78
3 – Steel Erection	Tower Crane (C4.48)	76
	Sarens SCG 120 Crane	86
	Articulated lorry (C11.10)	77
4 – General Construction	Hand tools	81
	Pneumatic Circular Saw (D7.79)	75
	Internal fit – out	70
	Dozer (C2.13)	78
5 - Landscaping	Dump Truck (C4.2)	78
	Surfacing (D8.25)	68

A number of representative noise sensitive locations have been considered in relation to the proposed development as illustrated in Figure 11.4.

Table 11.12 presents the predicted construction noise levels in the vicinity of the site. Calculations have assumed an on time 66% for each item of plant i.e. 8-hours over a 12 hours assessment period.

Table 11-12: Review of Potential Daytime Construction Noise Levels

Ref.	Baseline Noise Level dB $L_{Aeq,1hr}$	BS5228-1 Threshold dB $L_{Aeq,1hr}$	Predicted Construction Noise Level for Various Phases (dB $L_{Aeq,1hr}$)				
			Site Preparation	Foundations	Steel Erection	General Construction	Landscaping
R01	45	65	51	41	46	37	28
R02	60	65	47	41	42	39	34
R03	60	65	47	41	42	38	33
R04	60	65	46	40	41	38	33
R05	60	65	42	36	39	35	29
R06 [1]	52	70	53	46	47	43	38
R07 [1]	63	70	41	35	37	32	26
R08	63	70	53	47	47	43	38
R09	52	65	60	53	52	49	44
R10 [1]	63	70	53	47	47	44	39
R11 [1]	63	70	54	47	47	45	40
R12 [1]	63	70	53	47	47	44	39
R13 [1]	63	70	52	46	46	43	38
R14	63	70	51	45	46	43	37
R15	50	65	63	55	54	51	47
R16	50	65	45	38	39	35	31

Note 1 Commercial Property, therefore Threshold of 70 dB $L_{Aeq,1hr}$ applies.

Table 11-12 details the baseline noise level measured at the nearest survey noise monitoring location or based on expected ambient noise levels in the vicinity of the location based on proximity to an existing noise source (e.g. road). If the predicted construction noise level is below this value the associated impact is deemed to be 'Not Significant'.

Where the predicted construction noise level is above the baseline noise level but below the stated BS5228-1 threshold value the associated impact is deemed be between 'Slight' and 'Moderate'. If a predicted noise level is below or equal to the BS5228-1 threshold value, the impact is deemed to be 'Not Significant'. Where the predicted construction noise level is 5 dB or mode higher than the BS5228-1 threshold value the impact is assumed to be 'Moderate' to 'Significant'.

Note, where a non-residential assessment location is being considered a threshold value of 70 dB $L_{Aeq,1hr}$ has been adopted.

Based on the above rationale, and the predicted noise levels presented the assigned impacts are summarised as follows:

Table 11-13: Review of Potential Daytime Construction Noise Impact

Ref.	Predicted Construction Noise Impacts for Various Phases				
	Site Preparation	Foundations	Steel Erection	General Construction	Landscaping
R01	Slight	Not Significant	Slight	Not Significant	Not Significant
R02	Not Significant	Not Significant	Not Significant	Not Significant	Not Significant
R03	Not Significant	Not Significant	Not Significant	Not Significant	Not Significant
R04	Not Significant	Not Significant	Not Significant	Not Significant	Not Significant
R05	Not Significant	Not Significant	Not Significant	Not Significant	Not Significant
R06	Not Significant	Not Significant	Not Significant	Not Significant	Not Significant
R07	Not Significant	Not Significant	Not Significant	Not Significant	Not Significant
R08	Not Significant	Not Significant	Not Significant	Not Significant	Not Significant
R09	Slight	Slight	Not Significant	Not Significant	Not Significant
R10	Not Significant	Not Significant	Not Significant	Not Significant	Not Significant
R11	Not Significant	Not Significant	Not Significant	Not Significant	Not Significant
R12	Not Significant	Not Significant	Not Significant	Not Significant	Not Significant
R13	Not Significant	Not Significant	Not Significant	Not Significant	Not Significant
R14	Not Significant	Not Significant	Not Significant	Not Significant	Not Significant
R15	Slight	Slight	Slight	Slight	Not Significant
R16	Not Significant	Not Significant	Not Significant	Not Significant	Not Significant

In the majority of cases, the construction noise impact is Not Significant; in a small number of cases, a Slight impact is predicted.

11.4.2.1.2 Vibration

Due to the distance of the proposed works from sensitive locations significant vibration effects are not expected.

11.4.2.1.3 Description of Effects

With respect to the EPA's criteria for description of effects, the potential worst-case associated effects at the nearest noise sensitive locations associated with this aspect of the construction phase are described below.

Quality	*Significance*	*Duration*
Negative	Slight	Short-term

The above effects should be considered in terms that the effect is variable and that this assessment considers the locations of the greatest potential impact.

11.4.2.2 Construction Traffic

This section has been prepared in order to review potential noise impacts associated with construction traffic on the local road network. Chapter 15 of this EIAR presents an assessment

of traffic and transportation and reference has been made to this chapter to inform the following discussion.

In terms of the additional construction traffic on local roads that will be generated as a result of the proposed development the following comment is presented: Considering that in order to increase traffic noise levels by 1 dB traffic volumes would need to increase by the order of 25%. It is considered that additional traffic introduced onto the local road network due to the construction phase associated with the development, as outlined in the relevant sections of Chapter 15 will not result in a significant noise impact.

11.4.2.2.1 Vibration

Construction vehicle movements are not expected as a significant source of vibration along the existing road networks.

11.4.2.2.2 Description of Effects

With respect to the EPA's criteria for description of effects, the potential worst-case associated effects at the nearest noise sensitive locations are described below.

Quality	*Significance*	*Duration*
Negative	Not Significant	Short-term

11.4.3 Potential Effects – Operational Phase

11.4.3.1 Assessment of Transformer Noise

Table 11-14 presents the predicted noise at all assessment locations considering the impact of the Proposed Development.

Table 11-14: Predicted Noise Levels

Ref.	Sound Pressure (dB) per Octave Band Centre Freq (Hz)								dB(A)
	63	125	250	500	1k	2k	4k	8k	
R01	13	8	8	6	6	--	--	--	9
R02	13	9	9	7	1	--	--	--	7
R03	13	9	9	7	1	--	--	--	7
R04	12	9	8	6	--	--	--	--	6
R05	9	6	5	3	--	--	--	--	3
R06	21	16	17	18	14	5	4	--	18
R07	14	9	7	4	--	--	--	--	4
R08	20	15	15	17	13	4	3	--	18
R09	22	19	19	21	17	9	12	--	22
R10	18	14	14	16	11	3	1	--	16
R11	17	13	13	16	11	2	--	--	16
R12	13	8	9	11	6	--	--	--	11
R13	12	5	4	2	--	--	--	--	2
R14	11	4	3	--	--	--	--	--	1

Ref.	Sound Pressure (dB) per Octave Band Centre Freq (Hz)								dB(A)
	63	125	250	500	1k	2k	4k	8k	
R15	15	10	8	4	--	--	--	--	6
R16	8	3	3	4	--	--	--	--	6

A noise contour for day to day operation of the proposed development has been presented in Appendix 11-3. Table 11-15 compares the predicted noise at all assessment locations against the adopted criteria.

Table 11-15: Review of Overall Noise Levels

Ref.	Predicted Noise Level dB(A)	Criterion dB $L_{Aeq,15min}$	Excess (dB)
R01	9	37	--
R02	7	37	--
R03	7	37	--
R04	6	37	--
R05	3	37	--
R06	18	55	--
R07	4	55	--
R08	18	55	--
R09	22	55	--
R10	16	55	--
R11	16	55	--
R12	11	55	--
R13	2	55	--
R14	1	39	--
R15	6	55	--
R16	6	55	--

The updated predicted noise levels satisfy the relevant noise criteria adopted in this assessment.

Table 11-16, 11-17 and 11-18 present the predicted changes in noise level associated with the development at the nearest residential noise sensitive locations to the site.

Table 11-16: Review of Predicted Changes in Existing Noise Levels – Day

Ref.	Daytime (07:00 – 19:00 hrs)				
	Predicted dB $L_{Aeq,T}$	Background Level dB $L_{A90,T}$	Cumulative Noise Level (dB(A))	Change in Noise Level (dB)	EPA Glossary of Impacts
R01	9	43	43	0	Not Significant
R02	7	52	52	0	Not Significant
R03	7	52	52	0	Not Significant
R04	6	52	52	0	Not Significant
R05	3	52	52	0	Not Significant
R14	1	52	52	0	Not Significant

Table 11-17: Review of Predicted Changes in Existing Noise Levels – Evening

Ref.	Evening (19:00 – 23:00 hrs)				
	Predicted dB $L_{Aeq,T}$	Background Level dB $L_{A90,T}$	Cumulative Noise Level (dB(A))	Change in Noise Level (dB)	EPA Glossary of Impacts
R01	9	38	38	0	Not Significant
R02	7	42	42	0	Not Significant
R03	7	42	42	0	Not Significant
R04	6	42	42	0	Not Significant
R05	3	42	42	0	Not Significant
R14	1	42	42	0	Not Significant

Table 11-18: Review of Predicted Changes in Existing Noise Levels – Night

Ref.	Night (23:00 – 07:00 hrs)				
	Predicted dB $L_{Aeq,T}$	Background Level dB $L_{A90,T}$	Cumulative Noise Level (dB(A))	Change in Noise Level (dB)	EPA Glossary of Impacts
R01	9	37	37	0	Not Significant
R02	7	39	39	0	Not Significant
R03	7	39	39	0	Not Significant
R04	6	39	39	0	Not Significant
R05	3	39	39	0	Not Significant
R14	1	39	39	0	Not Significant

Review of the predicted increases in noise level at the nearest residential noise sensitive locations conclude that the associated impact is 'Not Significant' at all locations for daytime, evening and night time periods.

Description of Effects

With respect to the EPA's criteria for description of effects, the potential worst-case associated effects at the nearest noise sensitive locations associated with operation of the Proposed Development is described below.

Quality	*Significance*	*Duration*
Negative	Not Significant	Long-term

There are no expected sources of vibration associated with the operational phase of the proposed development. In relation to vibration the associated effect is summarised as follows:

Quality	*Significance*	*Duration*
Negative	Imperceptible	Long-term

11.4.3.2 Additional Road Traffic

In terms of the additional traffic on local roads that will be generated as a result of this development the following comment is presented: Considering that in order to increase traffic noise levels by 1 dB traffic volumes would need to increase by the order of 25% it is considered that additional traffic introduced onto the local road network due to this development will not result in a significant noise impact. The resultant noise impact is neutral, imperceptible and long-term.

Description of Effects

With respect to the EPA's criteria for description of effects, the potential worst-case associated effects at the nearest noise sensitive locations associated with operation of the additional road traffic is described below.

Quality	*Significance*	*Duration*
Negative	Imperceptible	Long-term

11.4.3.3 Decommissioning Phase

In relation to the decommissioning phase, similar overall noise levels as those calculated for the construction phase would be expected, as similar tools and equipment will be used and a similar noise and vibration impact as outlined previously would be applicate in this instance.

11.4.3.4 Cumulative Impacts

The environmental noise survey takes account of noise emissions from existing developments including nearby data centres. It was noted that the existing ambient noise levels in the area were dominated primarily by road traffic on the surrounding road network.

The noise criteria proposed for Proposed Development plant items has been derived with consideration of existing site noise emissions levels to ensure that cumulative noise emissions do not exceed the relevant noise criteria.

The potential cumulative noise emissions from the proposed development, the approved Gas Fired Peaking Power Plant (i.e. Profile Park), DUB69 and Cyrus One Data Centre and Microsoft have been considered. Reference is made Chapter 10 of the Profile Park EIAR, to Section 10 of the Cyrus One EIAR, Section 10 of the DUB69 EIAR and Section 8.0 of the Microsoft DUB14/15 EIAR which present noise predictions to nearby shared residential receptors.

The closest shared receptors to the two neighbouring sites are the receivers R02 and R14. Table 11-19 presents the predicted cumulative noise levels to these two receivers and highlights the predicted increase in noise level .

Table 11-19: Assessment of Cumulative Noise

Ref.	Noise Level (dB $L_{Aeq,T}$)					Cumulative dB(A)	Change in Noise Level (dB)
	Proposed Development	Profile Park	Cyrus One	DUB69	Existing (Night)		
R02 [A]	7	35	12	31	37	40	+3
R14 [B]	1	38	12	30	39	42	+3

Note A NSL R8 in DUB69 assessment R7 (extrapolated) in Cyrus One assessment.
Note B NSL R14 (extrapolated) in DUB69 assessment R7 (extrapolated) in Cyrus One assessment.

Review of the predicted noise levels associated with the Proposed Development are so low they are not considered significant and there is no potential for any cumulative impacts.

11.5 MITIGATION MEASURES

The assessment of potential impact has demonstrated that the proposed development is expected to comply with the identified criteria for both the construction, operational and decommissioning phases. However, to ameliorate any noise and vibration effects, a schedule of noise control measures has been formulated for both construction/decommissioning and operational phases.

11.5.1 Construction and Decommissioning Phases

The comments in this section relate primarily to the construction phase, but are apply equally to the decommissioning phase:

Regarding construction/decommissioning activities, reference shall be made to BS 5228-1:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites – Noise*, which offers detailed guidance on the control of noise and vibration from construction activities. It is proposed that various practices be adopted during construction as required, including the following:

- limiting the hours during which site activities likely to create high levels of noise or vibration are permitted;
- establishing channels of communication between the contractor/developer, Local Authority and residents;
- appointing a site representative responsible for matters relating to noise and vibration; and
- keeping the surface of the site access roads even to mitigate the potential for vibration from lorries.

Furthermore, a variety of practicable noise control measures will be employed. These include:

- selection of plant with low inherent potential for generation of noise and/ or vibration;
- placing of noisy / vibratory plant as far away from sensitive properties as permitted by site constraints, and;
- regular maintenance and servicing of plant items.

11.5.1.1 Noise

The contract documents shall specify that the Contractor undertaking the construction of the works will be obliged to take specific noise abatement measures when deemed necessary to comply with the recommendations of BS 5228-1:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites – Noise.* The following list of measures will be considered, where necessary, to ensure compliance with the relevant construction noise criteria:

- No plant used on site will be permitted to cause an on-going public nuisance due to noise.
- The best means practicable, including proper maintenance of plant, will be employed to minimise the noise produced by on site operations.
- All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the contract.
- Compressors will be attenuated models, fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers.
- Machinery that is used intermittently will be shut down or throttled back to a minimum during periods when not in use.
- Any plant, such as generators or pumps, which is required to operate before 07:00hrs or after 19:00hrs will be surrounded by an acoustic enclosure or portable screen.
- During the construction programme, supervision of the works will include ensuring compliance with the limits detailed in Table 11-1 using methods outlined in BS 5228-1:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites – Noise*.
- The hours of construction activity will be limited to avoid unsociable hours where possible. Construction operations shall generally be restricted to between 7:00hrs and 19:00hrs weekdays and between 9:00hrs and 13:00hrs on Saturdays. However, to ensure that optimal use is made of good weather period or at critical periods within the programme (i.e. concrete pours) or to accommodate delivery of large turbine component along public routes it could be necessary on occasion to work outside of these hours. Any such out of hours working will be agreed in advance with the local Planning Authority.

11.5.1.2 Vibration

Vibration associated with construction activities will be limited to the values set out in Table 11-3. It should be noted that these limits are not absolute but provide guidance as to magnitudes of vibration that are very unlikely to cause cosmetic damage.

Site investigations have indicated that no piling activities are anticipated. Therefore, no mitigation measures are proposed.

On review of the likely vibration levels associated with construction activities, it is concluded that the construction of the proposed development is not expected to give rise to vibration that is either significantly intrusive or capable of giving rise to structural or cosmetic damage to buildings.

In the unlikely event of vibration levels giving rise to human discomfort, in order to minimise such impacts, the following measures shall be implemented during the construction period:

- A clear communication programme will be established to inform closest building occupants in advance of any potential intrusive works which may give rise to vibration

levels likely to exceed perceptible levels. The nature and duration of the works will be clearly set out in all communication circulars.
- Alternative less intensive working methods and/or plant items shall be employed, where feasible.
- Appropriate vibration isolation shall be applied to plant, where feasible.
- Cut off trenches to isolate the vibration transmission path shall be installed where required.
- Monitoring will be undertaken at identified sensitive buildings, where proposed works have the potential to be at or exceed the vibration limit values.

11.5.2 Operational Phase

Noise from external plant will be minimised by the following measures:
- Purchasing low noise generating equipment, and;
- Incorporating appropriately specified in line attenuators for stacks and exhausts where necessary.

With due consideration as part of the detailed design process, this approach will result in the site operating well within the constraints of the best practice guidance noise limits that have been adopted as part of this detailed assessment.

11.5.3 Decommissioning Phase

The mitigation measures that will be considered in relation to any decommissioning of the site are the same as those proposed for the construction phase of the development, i.e. as per Section 11.5.1.

11.5.4 Monitoring

11.5.4.1 Construction Phase

Noise and vibration monitoring is proposed in accordance with the guidance contained in *British Standard BS5528* during the construction phase.

11.5.4.2 Operational Phase

As part of the EPA IED license that will be applicable to the site annual noise monitoring will be required to ensure noise emissions comply with relevant criteria.

11.6 RESIDUAL EFFECTS

This section summarises the likely residual noise and vibration effects associated with the proposed development following the implementation of mitigation measures.

11.6.1 Construction / Decommissioning Phases

During the construction phase of the project there will be some effect on nearby noise sensitive properties due to noise emissions from site traffic and other construction activities. However, given the distances between the main construction works and nearby noise sensitive properties and the fact that the construction phase of the development is temporary in nature, it is expected that the various noise sources will not be excessively intrusive. Furthermore, the

application of binding noise limits and hours of operation, along with implementation of appropriate noise and vibration control measures, will ensure that noise and vibration effect is kept to a minimum.

With respect to the EPA's criteria for description of effects, in terms of these construction activities, the potential worst-case associated effects at the nearest noise sensitive locations associated with the various elements of the construction phase are described below.

The effects below should be considered in terms that the effect is variable and that this assessment considers the locations of the greatest potential impact.

11.6.1.1 General Construction

Noise Assessment

Quality	*Significance*	*Duration*
Negative	Slight	Short-term

Vibration Assessment

Quality	*Significance*	*Duration*
Negative	Not Significant	Short-term

11.6.1.2 Construction Traffic

The predicted residual construction traffic effects during the construction phase are summarised as follows:

Noise Assessment

Quality	*Significance*	*Duration*
Negative	Not Significant	Short-term

Vibration Assessment

Quality	*Significance*	*Duration*
Negative	Not Significant	Momentary

11.6.2 Operational Phase

11.6.2.1 Day to Day Noise

The predicted residual operational noise effects are summarised as follows at the closest noise sensitive locations to the site:

Quality	*Significance*	*Duration*
Negative	Not Significant	Long-term

In terms of vibration, the effect of the operational site is as follows:

Quality	*Significance*	*Duration*
Negative	Not Significant	Long-term

11.6.3 Cumulative Effects

Cumulative assessment has been considered here with due consideration of the proposed development in combination with any existing permitted and developments in the wider study area as noted in Section 11.4.3.1. It has been predicted that the cumulative effects are Not Significant during daytime and evening periods and Slight during night time periods.

11.7 CONCLUSION

When considering a development of this nature, the potential noise and vibration effects on the surroundings must be considered for two stages: the short-term construction and the long-term operational phase.

The assessment of construction noise and vibration and has been conducted in accordance best practice guidance contained in *BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise and BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Vibration*. Subject to good working practice as recommended in the EIAR, noise associated with the construction phase is not expected to exceed the recommended limit values. The associated noise and vibration are not expected to cause any significant effects.

Based on detailed information on the site layout, plant noise emission levels, noise levels have been predicted at NSLs. The predicted operational noise levels will be within best practice noise limits; therefore, it is not considered that a significant effect is associated with the development.

No significant vibration effects are associated with the operation of the site.

11.8 REFERENCES

- EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIA Reports) (2022) and draft revised Guidelines on information to be contained in Environmental Impact Statements; and Advice Notes for preparing EIS (2015).
- Draft '*Guidelines for Noise Impact Assessment*' produced by the Institute of Acoustics/Institute of Environmental Management and Assessment Working Party.
- *British Standard BS 5228 – 1: 2009+A1:2014: Code of practice for noise and vibration control on construction and open sites – Noise*.
- Transport Infrastructure Ireland (TII) publication *Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes (2014).*
- British Standard BS 7385: 1993: *Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration*.
- British Standard BS 5228-2: 2009+A1:2014: *Code of practice for noise and vibration control on construction and open sites – Vibration*.
- BS 4142:2014: *Methods for rating and assessing industrial and commercial sound.*
- BS 8233:2014: *Guidance on sound insulation and noise reduction for buildings.*
- Environmental Protection Agencies *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)* (January 2016).
- ISO 1996-2:2017 *Acoustics - Description, measurement and assessment of environmental noise – Part 2: Determination of environmental noise levels.*
- British Standard *BS 6472 (1992): Guide to Evaluation of human exposure to vibration in buildings (1Hz to 80Hz).*
- ISO 9613 (1996): *Acoustics – Attenuation of sound outdoors – Part 2: General method of calculation.*
- *Calculation of Road Traffic Noise (CRTN)* issued by the Department of Transport in 1988.
- BS EN 1793-1:1998: *Road traffic noise reducing devices – Test method for determining the acoustic performance – Part 1: Intrinsic characteristics of sound absorption*
- BS EN 1793-2:1998: *Road traffic noise reducing devices – Test method for determining the acoustic performance – Part 2: Intrinsic characteristics of airborne sound insulation.*
- BS EN 1794-1:2003: *Road traffic noise reducing devices. Non-acoustic performance. Mechanical performance and stability requirements*
- BS EN 1794-2:2003: *Road traffic noise reducing devices. Non-acoustic performance. General safety and environmental requirements.*

12.0 BIODIVERSITY

12.1 INTRODUCTION

This chapter presents a Biodiversity Impact Assessment of the proposed development and should be read in conjunction with Chapter 3 (Description of the Proposed Development). Details of the assessment methodology and existing site conditions are presented, potential impacts are assessed, and mitigation measures are recommended, where required.

The aims of this assessment were to:

- To obtain baseline ecological data and record environmental conditions at the proposed development site and surrounding environs;
- To determine the ecological value and sensitivity of the identified ecological receptors;
- To assess the significance of effects of the potential impacts, including direct, indirect and secondary impacts, which may result from the proposed development during construction, operation and/or decommissioning;
- To recommend mitigation measures to avoid and/or reduce the significance of the identified impacts; and
- To identify any residual impacts post mitigation and restoration measures.

The potential impacts of the proposed development on European sites (sites designated as Special Areas of Conservation [SACs] or Special Protection Areas [SPAs] that form part of the Natura 2000 network) within the Zone of Influence (ZoI) of the proposed development have been evaluated as required under Article 6(3) and 6(4) of the Habitat Directive. This appraisal is presented separately in the form of a Screening for Appropriate Assessment (which accompanies the Planning Application documentation).

12.2 STATEMENT OF AUTHORITY

This chapter was prepared by Áine Sands B.Sc. (Hons), Senior Ecologist with TOBIN. Áine has seven years post-graduate experience in ecology and environmental consultancy. Áine has predominantly been involved in large public and private infrastructure projects where she has carried out numerous Screenings for Appropriate Assessments, Natura Impact Statements and Ecological Impact Assessments for the proposed developments. Áine has a strong understanding of National and European legislation associated with biodiversity and is cognisant of relevant rulings by the Court of Justice of the European Union (CJEU). Áine also has experience with undertaking ecological surveys for protected habitats and species.

This chapter was senior reviewed by Laura Kennedy (M.Sc), Associate Director and Lead Ecologist in TOBIN's Environment and Planning section. She is a qualified and experienced environmental consultant with over 14 years' experience in environmental sciences and environmental consulting. Laura's expertise includes; Project Management, Environmental Impact Assessment Reporting, Appropriate Assessments, terrestrial, ornithological and aquatic ecological surveying, data analysis, environmental monitoring, and preparing technical reports. Laura has a strong technical background as an aquatic ecologist and has extensive field experience in biological and chemical water quality assessment. She has also conducted bird and nest surveys, bat surveys, amphibian surveys, and carried out fish habitat assessments, which included electrofishing, minnow trapping and fish identification.

12.3 METHODOLOGY

12.3.1 Legislation, Plans, Policies and Guidance

The following legislation was considered in this chapter of the Environmental Impact Assessment Report (EIAR), where relevant:

- European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011), as amended. With particular reference to the Third Schedule of the European Communities Regulations 2011 (S.I. No. 477 of 2011) which deals with invasive species;
- The EIA Directive 2011/92/EU, as amended by Directive 2014/52/EU;
- European Union (EU) (Environmental Impact Assessment and Habitats) (No. 2) Regulations 2015 (S.I. No. 320/2015);
- Environmental Liabilities Directive (2004/35/EC);
- Council Directive 92/43/EEC of 21 May 1992 on the Conservation of Natural Habitats and of Wild Fauna and Flora, herein referred to as the Habitats Directive;
- Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the Conservation of Wild Birds, herein referred to as the Birds Directive;
- The EU Water Framework Directive (2000/60/EC);
- The Wildlife Acts 1976 to 2022 (as amended), herein referred to as the Wildlife Acts;
- The Flora (Protection) Order 2022 (S.I. No. 235 of 2022);
- Relevant fisheries legislation up to and including the Inland Fisheries Acts 1959-2017, as amended.

The following plans and their objectives and policies have also been considered in this chapter:

- Objectives and policies relevant to ecology and biodiversity in the South Dublin County Development Plan 2022-2028[1];
- Relevant policies in Ireland's 3rd National Biodiversity Action Plan, 2017 – 2021 produced by the Department of Culture, Heritage and the Gaeltacht[2];
- Climate Action Plan 2023 (CAP23)[3].

The potential for effects on key ecological receptors (KERs[4]) was assessed, taking into consideration the habitats and species that are likely to be affected by the proposed development. This approach included consideration (as appropriate) of the following guidance documents:

- Fossitt (2000). A Guide to Habitats in Ireland. The Heritage Council;
- Environmental Protection Agency (EPA) (2022). Guidelines on the Information to be Contained in Environmental Impact Assessment Reports;
- Charted Institute of Ecology and Environmental Management (CIEEM) (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.1. Chartered Institute of Ecology and Environmental Management, Winchester;
- Bird Species of Medium and High Conservation Concern Listed in the Publication Birds of Conservation Concern in Ireland (BoCCI) 2020 – 2026 (Gilbert *et al.*, 2021);
- SNH (2016). Assessing Connectivity with Special Protection Areas (SPAs);

[1] https://www.sdcc.ie/en/devplan2022/adopted-plan/county-development-plan-written-statement/county-development-plan-written-statement.pdf

[2]https://www.npws.ie/sites/default/files/publications/pdf/National%20Biodiversity%20Action%20Plan%20English.pdf

[3] Accessed [December 2022] via https://www.gov.ie/en/publication/7bd8c-climate-action-plan-2023/

[4] KERs are those biodiversity receptors within the ZoI of the proposed development which are "both of sufficient value to be material in decision making and likely to be affected significantly" i.e. with an ecological value of local importance (higher value) or greater.

- NRA (2005). Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes;
- NRA (2006a). Guidelines for the Treatment of Otters prior to the Construction of National Roads Schemes. National Roads Authority, Dublin;
- NRA (2006b). Best Practice Guidance for the Conservation of Bats in the Planning of National Road Schemes;
- NRA (2008). Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes;
- NRA (2009). Guidelines for Assessment of Ecological Impacts of National Road Schemes. (Revision 2, National Roads Authority);
- NRA (2010). Guidelines on the Management of Noxious Weeds and Non-Native Plan Species on National Roads;
- Transport Infrastructure Ireland (2020). The Management of Invasive Alien Plant Species on National Roads – Technical Guidance; and
- Smith, G. F., O'Donoghue, P., O 'Hora, K., & Delaney, E. (2011). Best Practice Guidance for Habitat Survey and Mapping. Ireland's Heritage Council: Kilkenny, Ireland.

12.3.2 Study Area

As discussed in Chapter 3 of this EIAR (Description of Development), the proposed development includes the development of a 110kV electrical substation (hereafter referred to as the Baldonnell substation) and associated grid connection to provide a connection from the adjacent gas fired peaking power plant to the existing electricity transmission system, at a site located in Profile Park, Dublin 22.

The study area for this Biodiversity Assessment comprised the proposed Baldonnell substation site and associated network infrastructure, plus the wider surrounding hinterland. The wider surrounding environment comprises a mixture of industrial developments and agricultural and amenity grasslands. The study area comprises all lands located within the ZoI of the proposed development. The ZoI is described hereunder.

12.3.2.1 Zone of Influence

The current guidance on ecological assessments (CIEEM, 2018) states that:

" *The 'zone of influence' for a project is the area over which ecological features may be affected by biophysical changes as a result of the proposed project and associated activities. This is likely to extend beyond the project site, for example where there are ecological or hydrological links beyond the site boundaries*" and that " *The zone of influence will vary for different ecological features depending on their sensitivity to an environmental change."*

The ZoI has therefore been defined through a desk-based assessment with regard to the sensitivity of habitats and species possibly present / previously recorded in the locality of the proposed development, areas with connectivity (physical, hydrological or ecological) to the proposed development site boundary and potential impacts which may arise. How the ZoI was established is summarised hereunder:

- On the basis of the desk-based assessment, the main habitats located within the proposed development site and surrounding lands were found to likely comprise a mixture of grassland and commercial developments. Given the location of the proposed development site, and having regard to the habitats likely to be present (determined through the desktop assessment) the following protected species were considered likely to occur within the surrounding environs; badger *(Meles meles),* otter *(Lutra lutra),* bat *(Chiroptera spp.)* and common farmland bird species.

- The outer extent of the ZoI for protected mammal species was therefore defined with regard to the NRA (2005) and the NRA (2006a) guidelines which both state that noise impacts from construction works can impact breeding badger setts / otter holts within 150m of construction works. Other protected mammal species likely to be present in the locality will have a smaller ZoI, as impacts are predominantly associated with habitat damage and will therefore be captured within the 150m ZoI. The ZoI for bats relates to their commuting / foraging routes and location of roost sites; the potential for which is determined through field assessment. An assessment of potential roost sites within the footprint of the works was undertaken (Section 12.5.2.11).
- The extent of the ZoI for protected bird species was established through potential impacts to birds from the proposed development. The main impacts to birds include; habitat loss, fragmentation of habitat, and disturbance. The ZoI for birds was therefore defined as the proposed development site boundary to account for habitat loss and several hundred meters from the site boundary to account for displacement and/or disturbance. Cutts *et al.* (2013) notes that different types of disturbance stimuli are characterised by different avifaunal reactions, however as a general rule of thumb, a distance of 300m can be used to represent the maximum likely disturbance distance for waterfowl. Notwithstanding, bird species will elicit differing behavioural responses to disturbance at different distances from the source of disturbance, therefore all bird species will be assessed individually.
- The ZoI of potential impacts on surface water quality in the receiving freshwater environment are likely to be confined to the Baldonnell Stream (Liffey_170) (IE_EA_09L012100) and the downstream environment. The Baldonnell Stream occurs approximately 120m east of the proposed development. The stream flows in a northernly direction before discharging into the River Liffey (Liffey_180) (IE_EA_09L012350) approximately 6.5km downstream.

12.3.2.2 Consultations

Consultation with various state agencies and environmental Non-Governmental Organisations (NGOs) was undertaken in December 2022 to inform this EIAR. Ecologically associated state agencies and NGOs, relevant to the proposed development, were contacted in order to obtain any additional information and data, which may have been useful in informing this assessment. The following organisations were contacted:

- Environmental Protection Agency (EPA);
- Development Application Unit (DAU); and
- Inland Fisheries Ireland (IFI).

At the time of writing this report, no response was received from the above-mentioned state agencies. Despite the lack of responses, it is considered that a robust assessment was undertaken using publicly available data and field survey data and final conclusions were not impeded.

12.3.2.3 Desk Study

An ecological desk study of the proposed development was undertaken to inform the assessment. Principal sources of information utilised for the desktop assessment included:

- Existing relevant mapping and databases e.g. species and habitat distribution from the following sources:
    - the National Parks and Wildlife Services [NPWS] website via; https://www.npws.ie/ (Accessed December 2022);

- the National Biodiversity Data Centre [NBDC] website via: https://biodiversityireland.ie (Accessed December 2022);
- the Environmental Protection Agency [EPA] website via: https://gis.epa.ie/EPAMaps/ (Accessed December 2022);
- The Water Framework Directive (WFD) Map Viewer via: https://www.catchments.ie/ (Accessed December 2022).

- Published and unpublished NPWS reports on protected habitats and species including Irish Wildlife Manual Reports, Species Action Plans and Conservation Management Plans;
- A review of all designated sites and their site synopsises for sites within the ZoI of the proposed development;
- Conservation Status Assessment Reports (CSARs), Backing Documents and Maps prepared in accordance with Article 17 of the Habitats Directive;
- A review of published data and documents from Bat Conservation Ireland (BCIreland), Botanical Society of Britain (BSBI) and IFI;
- A review of Ordnance Survey maps and aerial photography in order to determine the broad habitats that occur within the study area and thus typical bird communities; and
- A review of relevant ecological reports previously completed for the study area.

12.3.2.4 Field Survey

A multi-disciplinary ecological survey of the proposed development site was undertaken by a qualified and experienced TOBIN ecologist on the 5th of January 2023. The data collected was robust and allowed TOBIN to draw accurate, definitive and coherent conclusions on the possible impacts of the proposed development on ecological receptors. A description of the surveys undertaken is provided hereunder.

- A habitat and botanical survey were undertaken within the proposed development site following methods outlined within Smith *et al.* (2011) guidance: *'Guidance for Habitat Survey and Mapping'*. Habitats were classified according to Fossitt (2000) with reference made to the '*Interpretation Manual of European Union Habitats'* (EC, 2013) as appropriate. The proposed development site was also searched for evidence of invasive plant species listed in Part 1 of the Third Schedule of S.I No. 477/2011 – European Communities (Birds and Natural Habitats) Regulations 2011.
- A terrestrial mammal survey was carried out in line with guidance outlined in the NRA (2008): '*Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes'*. Target surveys for specific protected species were also undertaken as follows:
  - Otter surveys were undertaken along waterbodies (which included rivers, ponds and drainage ditches) within the proposed development site plus a 150m buffer, following methodologies outlined within the NRA (2006a) guidelines, and Chanin (2003) '*Monitoring the Otter Lutra Lutra'*. Any evidence of otter such as tracks, spraints, couches, slides, feeding remains or holts, were recorded.
  - Badger surveys were undertaken within the proposed development site plus a 150m buffer of the site. The survey followed methodologies outlined in '*Surveying Badgers'* (Harris *et al.,* 1989) and guidance outlined in the NRA guidance (NRA, 2005). Any evidence of badger activity such as setts, trails, latrines and feeding signs were recorded.
  - A bat roost assessment of all trees and structures within the proposed development site was carried out in accordance with the NRA (2006b) guidelines '*Best practice guidance for the Conservation of Bats in the Planning of National Road Schemes*' and Collins (2016) '*Bat surveys for Professional Ecologists: Good*

Practice Guidelines'. The daytime ground level visual assessment was carried out in order to determine potential roost features in trees.

- Observations of ornithological activity within the study area were recorded with regards to the Countryside Bird Survey guidelines CBS Manual, '*Guidelines for Countryside Bird Survey Participants*' (CBS, 2012).
- An aquatic habitat assessment was carried out along the stretch of the Baldonnell Stream located within the proposed development site and in the receiving environment directly downstream, using the methodology provided in the Scottish Environment Protection Agency '*River Habitat Survey in Britain and Ireland Field Survey Guidance Manual: 2003 Version*' (Environment Agency, 2003).

12.3.2.5 Survey Limitations

The habitat and botanical surveys were undertaken in January, which lies outside the optimal survey period (Smith *et al.*, 2011). There is therefore potential that protected or invasive plant species may not have been present at the time of the survey. The surveys were therefore supported with a robust desktop assessment, which included reviews of previous habitat surveys undertaken within the area, as well as a thorough review of plant species recorded to ensure all species were correctly identified. It was therefore considered that no protected or invasive plant species were missed during the survey. Notwithstanding, a pre-construction invasive species surveys will be carried out by the appointed Contractor, prior to the construction works commencing.

12.4 BASELINE EVALUATION CRITERIA

Ecological resources/receptors were evaluated following the NRA (2009) guidelines (Table 12-1), which set out the importance of the ecological resource/receptor in a geographic context. These guidelines are consistent with the approach recommended in CIEEM guidance (CIEEM, 2018).

The information gathered from desk studies and field surveys was used to carry out an Ecological Impact Assessment (EcIA) of the proposed development upon the identified ecological receptors and classification of their ecological importance, according to the NRA (2009) guidelines. Those features identified as being of high local importance or greater were given particular focus in the ecological evaluation as KERs when considering the potential for significant impacts and subsequent requirement for appropriate mitigation.

In addition, all potential impacts were assessed and characterised in accordance with the guidance produced by the EPA, *Guidelines on the information to be contained in Environmental Impact Assessment Report*' (EPA, 2022 – Table 12-2). Via this approach, a scientific, robust, and repeatable method was applied whereby all aspects of a potential impact were considered.

Table 12-1: Site Evaluation Criteria

Importance	Ecological Valuation
International Importance	• European sites including Special Area of Conservation (SAC), Site of Community Importance (SCI), Special Protection Area (SPA), proposed Special Area of Conservation (pSAC), proposed Special Protection Area (pSPA), and/or Site that fulfils the criteria for designation as a 'European Site' (see Annex III of the Habitats Directive, as amended). • Features essential to maintaining the coherence of the Natura 2000 Network. • Site containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive.

Importance	Ecological Valuation

	• Resident or regularly occurring populations (assessed to be important at the national level) of the following:
	  ○ Species of bird listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and/or
	  ○ Species of animal and plants listed in Annex II and/or IV of the Habitats Directive.
	• Ramsar Site (Convention on Wetlands of International Importance Especially Waterfowl Habitat 1971).
	• World Heritage Site (Convention for the Protection of World Cultural & Natural Heritage, 1972).
	• Biosphere Reserve (UNESCO Man & The Biosphere Programme).
	• Site hosting significant species populations under the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals, 1979).
	• Site hosting significant populations under the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats, 1979).
	• Biogenetic Reserve under the Council of Europe.
	• European Diploma Site under the Council of Europe.
	• Salmonid water designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988, (S.I. No. 293 of 1988).

National Importance	• Site designated or proposed as a Natural Heritage Area (NHA).
	• Statutory Nature Reserve.
	• Refuge for Fauna and Flora protected under the Wildlife Acts.
	• National Park.
	• Undesignated site fulfilling the criteria for designation as an NHA, Statutory Nature Reserve; Refuge for Fauna and Flora protected under the Wildlife Acts; and/or a National Park.
	• Resident or regularly occurring populations (assessed to be important at the national level) of the following:
	  ○ Species protected under the Wildlife Acts; and/or
	  ○ Species listed on the relevant Red Data list.
	• Site containing 'viable areas' of the habitat types listed in Annex I of the Habitats Directive.

County Importance	• Area of Special Amenity.
	• Area subject to a Tree Preservation Order.
	• Area of High Amenity, or equivalent, designated under the County Development Plan.
	• Resident or regularly occurring populations (assessed to be important at the County level) of the following:
	  ○ Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;
	  ○ Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;
	  ○ Species protected under the Wildlife Acts; and/or
	  ○ Species listed on the relevant Red Data list.
	• Site containing area or areas of the habitat types listed in Annex I of the Habitats Directive that do not fulfil the criteria for valuation as of International or National importance.
	• County important populations of species or viable areas of semi-natural habitats or natural heritage features identified in the National or Local Biodiversity Action Plan (BAP), if these have been prepared.
	• Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county.

Importance	Ecological Valuation
	• Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.

Local Importance (Higher Value)	• Locally important populations of priority species or habitats or natural heritage features identified in the Local BAP, if this has been prepared.
	• Resident or regularly occurring populations (assessed to be important at the Local level) of the following:
	  ○ Species of bird listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;
	  ○ Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;
	  ○ Species protected under the Wildlife Acts; and/or
	  ○ Species listed on the relevant Red Data list.
	• Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality;
	• Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value.

Local Importance (Lower Value)	• Sites containing small areas of semi-natural habitat that are of some local importance for wildlife. • Sites or features containing non-native species that are of some importance in maintaining habitat links.

Table 12-2: Description of Effects

Description of Effect	Definition
Quality of Effects	**Positive Effects** A change which improves the quality of the environment (for example, by increasing species diversity; or the improving reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).
	Neutral Effects No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
	Negative/Adverse Effects A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing nuisance).
Significance of Effects	**Imperceptible** An effect capable of measurement but without significant consequences.
	Not Significant An effect which causes noticeable changes in the character of the environment but without significant consequences.
	Slight Effects An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
	Moderate Effects An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends
	Significant Effects An effect which, by its character, magnitude, duration or intensity, alters a sensitive aspect of the environment
	Very Significant

Description of Effect	Definition
	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
	Profound Effects An effect which obliterates sensitive characteristics
Describing the Probability of Effects	**Likely Effects** The effects that can reasonably be expected to occur because of the planned project if all mitigations measures are properly implemented.
	Unlikely Effects The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented
Duration and Frequency of Effects	**Momentary Effects** Effects lasting from seconds to minutes
	Brief Effects Effects lasting less than a day
	Temporary Effects Effects lasting less than a year
	Short-term Effects Effects lasting one to seven years
	Medium-term Effects Effects lasting seven to fifteen years.
	Long-term Effects Effects lasting fifteen to sixty years.
	Permanent Effects Effects lasting over sixty years
	Reversible Effects Effects that can be undone, for example through remediation or restoration
	Frequency of Effects Once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually

12.5 EXISTING ENVIRONMENT

12.5.1 Output of Desk Study

The findings of the desk study are detailed hereunder.

12.5.1.1 Designated Conservation Sites

12.5.1.2 Sites of International Importance

The Birds Directive (2009/147/EC) and the Habitats Directive (92/42/EEC) put an obligation on EU Member States to establish the Natura 2000 network. The Natura 2000 network comprises sites of the highest biodiversity importance for rare and threatened habitats and species across the EU. In Ireland, the Natura 2000 network of European sites comprises SACs and SPAs, where SACs are selected for the conservation of Annex I habitats (including priority types, which are considered threatened) and Annex II species (other than birds). SPAs are selected for the conservation of Annex I birds and other regularly occurring migratory birds and their habitats.

Nine European sites (six SACs and three SPAs) occur within a 15km[5] radius of the proposed development site and are listed in Table 12-3 and are illustrated on Figure 12-1 below. The

[5] Guidance in Appropriate Assessment of plans and projects in Ireland notes that a distance of 15km is recommended for the identification of relevant European sites in the first instance (EHLG, 2010).

European sites; North Dublin Bay SAC (000206), South Dublin Bay SAC (000210), South Dublin Bay and River Tolka Estuary SPA (004024) and North Bull Island SPA (004006) are all hydrologically connected to the proposed development site via the Baldonnell Stream and the River Liffey (hydrological route ca. 30km downstream).

12.5.1.3 Sites of National Importance

Natural Heritage Areas (NHA) are the basic wildlife designation in Ireland. These areas are considered nationally important for the habitats present, or which holds species of plants and animals whose habitats need protection. Under the Wildlife Acts, NHAs are legally protected from damage from the date they are formally proposed for designation (source: www.npws.ie). Proposed Natural Heritage Areas (pNHA) were published on a non-statutory basis in 1995 and have not since been statutorily proposed or designated.

There are no NHAs located within 15km, or with a hydrological link, to the proposed development site.

Fifteen pNHAs occurs within 15km of the proposed development site and are listed in Table 12-3 below. Four pNHAs; Liffey Valley pNHA (000128), North Dublin Bay pNHA (000206), South Dublin Bay pNHA (000210) and Dolphin Docks pNHA (000201) are all hydrologically connected to the proposed development site via the Baldonnell Stream and the River Liffey (hydrological route ca. 30km downstream). All pNHAs are listed in Table 12-3 below and are illustrated on Figure 12-1.

12.5.1.4 Other Sites of Conservation Interest

Other sites of conservation interest within the ZoI or within 15km of the proposed development site are discussed hereunder:

- There are no National Parks located within 15km of the study area.
- There are no Nature Reserves located within 15km of the study area.
- Two RAMSAR sites; Sandymount Strand/Tolka Estuary (RAMSAR_Code: 832) and North Bull Island (RAMSAR_Code: 406) are located within Dublin Bay and therefore are hydrologically connected the proposed development site.

Table 12-3: Designated Conservation Sites within 15km of the Proposed Development

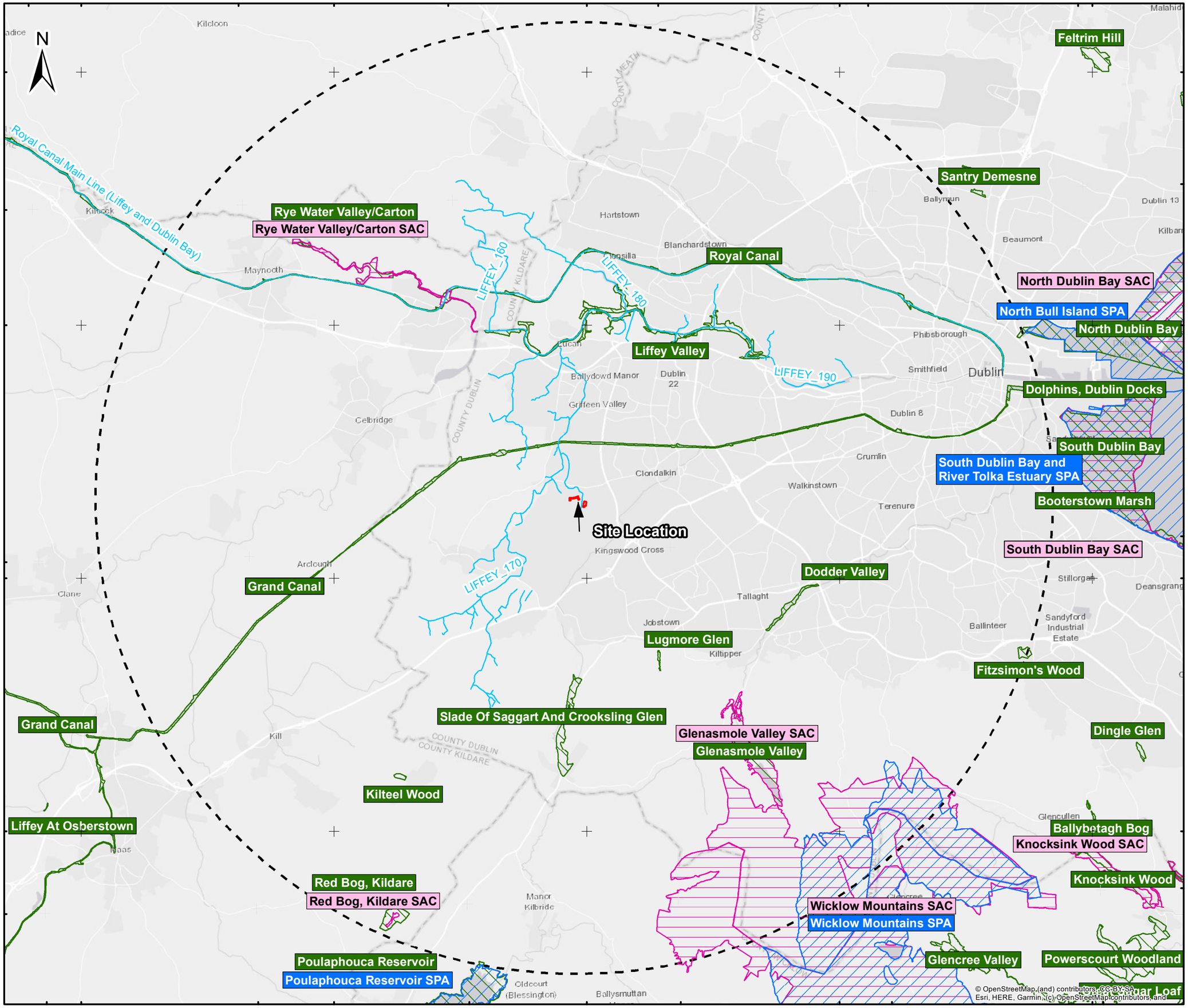
Name	Site Code	Approximate distance from the Proposed Development Site (km)	Pathway (Yes or No)
International Sites (European Sites)			
Rye Water Valley/Carton SAC (001398)	• Petrifying springs with tufa formation (Cratoneurion) [7220] • *Vertigo angustior* (Narrow-mouthed Whorl Snail) [1014] • *Vertigo moulinsiana* (Desmoulin's Whorl Snail) [1016]	Ca. 6.1km north-west of the proposed development site	No – no viable pathway between the proposed development and the SAC
Glenasmole Valley SAC (001209)	• Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] • Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae)* [6410] • Petrifying springs with tufa formation (Cratoneurion) [7220]	Ca. 7.8km south-east of the proposed development site	No – no viable pathway between the proposed development and the SAC
Wicklow Mountain SAC (002122)	• Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110] • Natural dystrophic lakes and ponds [3160] • Northern Atlantic wet heaths with *Erica tetralix* [4010] • European dry heaths [4030] • Alpine and Boreal heaths [4060] • Calaminarian grasslands of the *Violetalia calaminariae* [6130] • Species-rich Nardus grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe) [6230] • Blanket bogs (* if active bog) [7130] • Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Galeopsietalia ladani*) [8110] • Calcareous rocky slopes with chasmophytic vegetation [8210] • Siliceous rocky slopes with chasmophytic vegetation [8220]	Ca. 9.5km south-east of the proposed development site	No – no viable pathway between the proposed development and the SAC

Name	Site Code	Approximate distance from the Proposed Development Site (km)	Pathway (Yes or No)
	• Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0] • *Lutra lutra* (Otter) [1355]		
Red Bog, Kildare SAC (000397)	• Transition mires and quaking bogs [7140]	Ca. 15km south-west of the proposed development site	No – no viable pathway between the proposed development and the SAC
Wicklow Mountain SPA (004040)	• Merlin (*Falco columbarius*) [A098] • Peregrine (*Falco peregrinus*) [A103]	Ca. 12.8km south-east of the proposed development site	No – no viable pathway between the proposed development and the SAC
North Dublin Bay SAC (000206)	• Mudflats and sandflats not covered by seawater at low tide [1140] • Annual vegetation of drift lines [1210] • Salicornia and other annuals colonising mud and sand [1310] • Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] • Mediterranean salt meadows (*Juncetalia maritimi*) [1410] • Embryonic shifting dunes [2110] • Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] • Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] • Humid dune slacks [2190] • *Petalophyllum ralfsii* (Petalwort) [1395]	Ca. 15km east of the proposed development site and is hydrologically connected via the Baldonnell Stream and River Liffey (hydrological route ca. 25km)	Yes – a hydrological pathway exists via Baldonnell Stream and the River Liffey
South Dublin Bay SAC (000206)	• Mudflats and sandflats not covered by seawater at low tide [1140] • Annual vegetation of drift lines [1210] • Salicornia and other annuals colonising mud and sand [1310] • Embryonic shifting dunes [2110]	Ca. 15.5km east of the proposed development site and hydrologically connected via the Baldonnell Stream and River Liffey (hydrological route ca. 25km)	Yes – a hydrological pathway exists via Baldonnell Stream and the River Liffey

Name	Site Code	Approximate distance from the Proposed Development Site (km)	Pathway (Yes or No)
South Dublin Bay and River Tolka Estuary SPA (004024)	• Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] • Oystercatcher (*Haematopus ostralegus*) [A130] • Ringed Plover (*Charadrius hiaticula*) [A137] • Grey Plover (*Pluvialis squatarola*) [A141] • Knot (*Calidris canutus*) [A143] • Sanderling (*Calidris alba*) [A144] • Dunlin (*Calidris alpina*) [A149] • Bar-tailed Godwit (*Limosa lapponica*) [A157] • Redshank (*Tringa totanus*) [A162] • Black-headed Gull (*Chroicocephalus ridibundus*) [A179] • Roseate Tern (*Sterna dougallii*) [A192] • Common Tern (*Sterna hirundo)* [A193] • Arctic Tern (*Sterna paradisaea)* [A194] • Wetland and Waterbirds [A999]	Ca. 15km east of the proposed development site and hydrologically connected via the Baldonnell Stream and River Liffey (hydrological route ca. 25km)	Yes – a hydrological pathway exists via Baldonnell Stream and the River Liffey
North Bull Island SPA (004006)	• Light-bellied Brent Goose (Branta bernicla hrota) [A046] • Shelduck (Tadorna tadorna) [A048] • Teal (Anas crecca) [A052] • Pintail (Anas acuta) [A054] • Shoveler (Anas clypeata) [A056] • Oystercatcher (Haematopus ostralegus) [A130] • Golden Plover (Pluvialis apricaria) [A140] • Grey Plover (Pluvialis squatarola) [A141] • Knot (Calidris canutus) [A143] • Sanderling (Calidris alba) [A144] • Dunlin (Calidris alpina) [A149] • Black-tailed Godwit (Limosa limosa) [A156] • Bar-tailed Godwit (Limosa lapponica) [A157] • Curlew (Numenius arquata) [A160] • Redshank (Tringa totanus) [A162] • Turnstone (Arenaria interpres) [A169] • Black-headed Gull (Chroicocephalus ridibundus) [A179]	Ca. 18km north-east of the proposed development site and is and hydrologically connected via the Baldonnell Stream and River Liffey (hydrological route ca. 25km)	Yes – a hydrological pathway exists via Baldonnell Stream and the River Liffey

Name	Site Code	Approximate distance from the Proposed Development Site (km)	Pathway (Yes or No)
	• Wetland and Waterbirds [A999]		
National Sites			
Grand Canal pNHA (002104)	• Otter, • Smooth newt (*Lissotriton vulgaris*), • Opposite-leaved pondweed (*Groenlandia densa*)	Ca. 1.6km north of the proposed development site	No – no viable pathway between the proposed development and the pNHA
Liffey Valley pNHA (000218)	• River habitat and species	Ca. 4.6km north of the proposed development site	Yes – a hydrological pathway exists via Baldonnell Stream and the River Liffey
Lugmore Glen pNHA (001212)	• Woodland habitat	Ca. 5.3 north-east of the proposed development	No – no viable pathway between the proposed development and the pNHA
Slade of Saggart and Crooksling Glen pNHA (000211)	• Wooded river valley and wetland system	Ca. 5.5km south of the proposed development site	No – no viable pathway between the proposed development and the pNHA
Rye Water Valley /Carton pNHA (001398)	No site synopsis available	Ca. 6.1km north-west of the proposed development site	No – no viable pathway between the proposed development and the pNHA
Royal Canal pNHA (002103)	• Canal habitat and species	Ca. 6.4km north of the proposed development site	No – no viable pathway between the proposed development and the pNHA
Dodder Valley pNHA (000991)	• River habitat and species	Ca. 7.4km south-east of the proposed development site	No – no viable pathway between the proposed development and the pNHA
Glenasmole Valley pNHA (001209)	No site synopsis available	Ca. 7.8km south-east of the proposed development site	No – no viable pathway between the proposed development and the pNHA
Kilteel Wood pNHA (001394)	• Woodland habitat	Ca. 10.5km south-west of the proposed development site	No – no viable pathway between the proposed development and the pNHA

Name	Site Code	Approximate distance from the Proposed Development Site (km)	Pathway (Yes or No)
Red Bog, Kildare pNHA (000397)	No site synopsis available	Ca. 15km south-west of the proposed development site	No – no viable pathway between the proposed development and the pNHA
Poulaphouca Reservoir pNHA (000731)	No site synopsis available	Ca. 15km south of the proposed development site	No – no viable pathway between the proposed development and the pNHA
Fitzsimon's Wood pNHA (001753)	• Woodland habitat	Ca. 15km south-east of the proposed development site	No – no viable pathway between the proposed development and the pNHA
North Dublin Bay pNHA (000206)	No site synopsis available	Ca. 15km east of the proposed development site and is hydrologically connected via the Baldonnell Stream and River Liffey (hydrological route ca. 25km)	Yes – a hydrological pathway exists via Baldonnell Stream and the River Liffey
South Dublin Bay pNHA (000210)	No site synopsis available	Ca. 15.5km east of the proposed development site and is hydrologically connected via the Baldonnell Stream and River Liffey (hydrological route ca. 25km)	Yes – a hydrological pathway exists via Baldonnell Stream and the River Liffey
Dolphin Dublin Docks pNHA (000201)	No site synopsis available	Ca. 17km east of the proposed development site and is hydrologically connected via the Baldonnell Stream and River Liffey (hydrological route ca. 25km)	Yes – a hydrological pathway exists via Baldonnell Stream and the River Liffey



Legend

- Planning Application Boundary
- 15km Buffer from Substation boundary
- WFD - River Water Bodies - Hydrological Route
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- proposed Natural Heritage Area (pNHA)
- Natural Heritage Area (NHA)

0 1 2 3 4
Kilometers

NOTES

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

Rev	Date	Description	By	Chkd.
A	23/05/2023	Final issue	S.P	C.N

Client: Greener Ideas

Project: Profile Park power plant - Substation Application

Title: Figure 12-1: Designated Sites

Scale @ A3:	1:111,166	
Prepared by:	Checked by:	Date:
S.Pezzetta	C.Naughton	May 2023

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Map Ref: 11069-003-D.S-BUFF15-TOB-A

Draft: A

12.5.1.5 Data from Ecological Stakeholders

The desk study included a review of available data from ecological stakeholders and NGOs and the findings are summarised hereunder.

12.5.1.6 National Biodiversity Data Centre

A search of the NBDC database[6] was undertaken in December 2022, for protected flora and fauna, and plant species listed under the Third Schedule of the Birds and Natural Habitats Regulations (2011) within the 2km Irish Grid square O03F, which encompasses the proposed development site (refer to Table 12-3).

Table 12-4: Previous Records of Protected Fauna and Flora within the 2km grid square, O03F

Species	Date of last record	Designation	Location in Relation to the Proposed Development Site
Black-headed Gull *(Larus ridibundus)*	31/12/2011	WA, Amber Listed	Previously recorded within the 2km square grid (O03F) which encompasses the proposed development site
Great Black-backed Gull (*Larus marinus*)	31/12/2011	WA, Amber Listed	Previously recorded within the 2km square grid (O03F) which encompasses the proposed development site
Great Cormorant *(Phalacrocorax carbo)*	31/12/2011	WA, Amber Listed	Previously recorded within the 2km square grid (O03F) which encompasses the proposed development site
Herring Gull *(Larus argentatus)*	31/12/2011	WA, Amber Listed	Previously recorded within the 2km square grid (O03F) which encompasses the proposed development site
Lesser Black-backed Gull *(Larus fuscus)*	31/12/2011	WA, Amber Listed	Previously recorded within the 2km square grid (O03F) which encompasses the proposed development site
Little Grebe *(Tachybaptus ruficollis)*	31/12/2011	WA, Amber Listed	Previously recorded within the 2km square grid (O03F) which encompasses the proposed development site
Mallard *(Anas platyrhynchos)*	31/12/2011	Annex II, Annex III, WA, Amber Listed	Previously recorded within the 2km square grid (O03F) which encompasses the proposed development site
Mute Swan *(Cygnus olor)*	31/12/2011	WA, Amber Listed	Previously recorded within the 2km square grid (O03K) which encompasses the proposed development site
Northern Lapwing *(Vanellus vanellus)*	31/12/2011	Annex II, WA, Red Listed	Previously recorded within the 2km square grid (O03K) which encompasses the proposed development site
Tufted Duck *(Aythya fuligula)*	31/12/2011	Annex II, Annex III, WA, Amber Listed	Previously recorded within the 2km square grid (O03K) which encompasses the proposed development site
Daubenton's Bat *(Myotis daubentonii)*	19/08/2013	Annex IV, WA	A number of previous recordings located ca. 500m east, 800m south and 700 north-west of the proposed development site
Brown Long-eared Bat *(Plecotus auritus)*	25/08/2002	Annex IV, WA	A number of previous recordings located ca. 500m east, 800m south and 700 north-west of the proposed development site

[6] Accessed [December 2022] via: https://maps.biodiversityireland.ie/Map

Species	Date of last record	Designation	Location in Relation to the Proposed Development Site
Lesser Noctule *(Nyctalus leisleri)*	25/08/2002	Annex IV, WA	A number of previous recordings located ca. 500m east, 800m south and 700 north-west of the proposed development site
Pipistrelle *(Pipistrellus pipistrellus sensu lato)*	25/08/2002	Annex IV, WA	A number of previous recordings located ca. 500m east, 800m south and 700 north-west of the proposed development site
Soprano Pipistrelle *(Pipistrellus pygmaeus)*	19/08/2013	Annex IV, WA	A number of previous recordings located ca. 500m east and 700 north-west of the proposed development site
Pine Marten (*Martes martes*)	25/06/2020	WA	A previous recording of the species recorded ca. 1.4km north of the proposed development site.
West European Hedgehog *(Erinaceus europaeus)*	03/05/2012	WA	Closest previous recording located ca. 800m south of the proposed development site

12.5.1.7 Bat Landscape Tool

A review of the Bat Landscapes Tool[6] was utilised to determine the habitat suitability of the study area to support protected bat species. The bat 'habitat suitability' index is the research outcome of a study by Lundy *et al.* (2011) examining the relative importance of landscape and habitat associations across Ireland for bats. The 'habitat suitability' index ranges from 0 to 100 with 0 being least favourable and 100 most favourable for various bat species. The results of the Bat Landscape Tool are also shown in Table 12-5. The habitat suitability score for all bat species was 26.67 (moderate suitability).

A score of 26.67 lies within the middle rating (21.33 to 28.11) of the habitat suitability index for all bat species[66]. This rating suggests that there is moderate suitable habitat and roosting sites for bats within the proposed development site. This however was checked during field surveys (Section 12.5.2.11).

Table 12-5: Results of the Bat Landscape Tool

Species	Landscape Suitability Index
All Bat species	26.67
Soprano pipistrelle *(Pipistrellus pygmaeus)*	35
Brown long-eared bat *(Plecotus auratus)*	40
Common pipistrelle *(Pipistrellus pipistrellus)*	41
Lesser horseshoe bat *(Rhinolophus hipposideros)*	0
Lesser noctule *(Nyctalus leisleri)*	41
Whiskered bat *(Myotis mystacinus)*	19
Daubenton's bat *(Myotis daubentoniid)*	19
Nathusius's pipistrelle *(Pipistrellus nathusli)*	19
Natter's bat *(Myotis nattereri)*	26

12.5.1.8 Surface Water Features – Water Framework Directive

The Baldonnell Stream (Liffey_170) is located approximately 120m east of the proposed development site. The watercourse is assigned 'Poor' WFD status for the 2016-2021 period. The Baldonnell Stream flows in a northernly direction before flowing into the Grifeen River (Liffey_170) (IE_EA_09L12100) approximately 2km downstream of the proposed development

site. The watercourse then flows into the River Liffey (Liffey_180), approximately 6km downstream, which is also assigned 'Poor' WFD status for the 2016-2021 period. The River Liffey discharges into the Liffey Estuary, approximately 24km downstream of the proposed development site, and is assigned 'Good' WFD status 2016-2021 at the Liffey Estuary Upper (IE_EA_090_0400) and 'Moderate' WFD status at the Liffey Estuary Lower (IE_EA_090_0300).

12.5.1.9 Inland Fisheries Ireland

Inland Fisheries Ireland undertook electrofishing at 60 sites within the River Liffey catchment in 2019 to assess the status of fish stocks (IFI, 2019)[7]. Two survey sites were undertaken along the Grifeen River (Liffey_170) at Vesey Park (Site - 52) (ca. 5.4km downstream) and at Grifeen Avenue (Site – 53) (ca. 3.6km downstream of the proposed development). Fish species recorded at the two sites included brown trout (*Salmo trutta*), European eel (*Anguilla Anguilla*) and three-spined stickleback (*Gasterosteus aculeatus*), and both sites were assigned 'Moderate' fish ecological status.

12.5.1.10 Review of Previous Ecological Assessments

A review of past ecological surveys which were carried out in proximity to the proposed development was also undertaken and are summarised hereunder.

Profile Park Power Plant (Planning Ref: SD21A/0167)

Green Ideas Limited have been granted planning for the development of a 125 MW dual fuel gas fired power plant located immediately east of the proposed development site. Ecological field surveys were undertaken within the site to inform the planning application (TOBIN, 2021).

- No invasive or protected plant species were recorded within the power plant site during surveys.
- No evidence of protected terrestrial mammal activity was recorded during the surveys.
- A pair of breeding lapwings and their nest were recorded just outside the north-western boundary of the power plant site.
- A bat activity survey was undertaken which found low levels of bat activity around the site.

Kilcarbery Substation and Transmission Lines (Planning Ref: 312793)

Vantage Data Centers Dublin 11 Limited are seeking permission for the development of the Kilcarbery Substation and Transmission Line located immediately west of the proposed development site. Ecological field surveys were undertaken to inform their planning application, and are summarised hereunder (Neo Environmental Ltd, 2021).

- No protected or invasive plant species were recorded within the development site.
- A bat activity survey was undertaken, and a static bat detector was employed, and both surveys concluded that low levels of commuting/foraging bats use the site.
- No evidence of any other protected species was recorded.

Data Centre Development (Planning Ref: SD20A/0121)

Scott Cawley Ltd. were commissioned to undertake an ecological impact assessment to inform an Environmental Impact Assessment Report for the development of a Data Centre located approximately 320m north-west of the proposed development site (Marston Planning

[7] Accessed [January 2022] via Eastern River Basin District river surveys 2019 | Inland Fisheries Ireland (wfdfish.ie)

Consultancy, 2020). Similarly, a wide suite of ecological surveys were undertaken and the main findings are summarised hereunder.

- The Data Centre development site predominantly comprises agricultural grassland. No Annex I habitats or protected plant species were recorded within the site. The invasive plant species, Spanish blue bell *(Hyacinthoides hispanica)* was recorded within a garden of a derelict farmhouse, which is located approximately 870m north-west of the development site.
- Otter was recorded swimming in the Baldonnell Stream, approximately 600m north-west of the proposed development site. No bat roosts were confirmed during bat surveys. Two species of bat; Leisler's bat and common pipistrelle were recorded during emergence surveys. No signs of badger or other protected mammal species were recorded during the surveys.
- Notable bird species recorded during their bird surveys included kingfisher *(Alcedo atthis)* and grey wagtail *(Motacilla cinerea).* Two kingfisher were recorded along the Baldonnell Stream located within the Data Centre site. Grey wagtail was regularly recorded along the riverbank during winter surveys.

12.5.2 Output of Field Surveys

The findings of the ecological field surveys undertaken in January are detailed hereunder.

12.5.2.1 Habitats and Flora

All habitats were classified according to Fossitt (2000) during the ecological walkover of the proposed development site. The habitats within the proposed development footprint are described herein and illustrated on Figure 12-2. An assessment of the habitats was undertaken in accordance with the NRA (2009) guidelines.

12.5.2.2 Mosaic of Wet Grassland (GS4) and Spoil and Bare Ground (ED2)

The proposed development site has recently been disturbed by nearby construction works, which has resulted in the clearing of habitat and the stockpiling of sediment and spoil in areas. This has resulted in the site currently comprising of a mosaic of spoil and bare ground (ED2), in areas that have been cleared, and wet grassland (GS4) in areas which have not been disturbed (refer to Photo 1). Plant species recorded within the areas of wet grassland included soft rush (*Juncus effusus*), dandelion (*Taraxacum vulgaria*), ribwort plantain (*Plantago lanceolata*), silverweed (*Potentilla anserina*) and meadowsweet (*Filipendula ulmaria*).

As mentioned in Section 12.5.1.10, it's important to note, that during ecological surveys carried out by TOBIN in 2021, a lapwing nest was recorded within the wet grassland habitat in proximity to the proposed development site. In addition, during the current survey (2023), possible snipe (*Gallinago gallinago*) tracks were recorded adjacent to the proposed development site (refer to Section 12.5.2.13). The wet grassland habitat is therefore likely to support a number of protected bird species such as snipe and lapwing.

Therefore, despite the disturbed nature of the habitat, there is potential that the areas of wet grassland provide suitable habitats for protected bird species and the habitat was assessed as being Local Importance (higher value).

Photo 1: Mosaic of Wet Grassland and Bare Ground

12.5.2.3 Building and Artificial Surfaces (BL3)

The proposed grid connection will be located within the road (Falcon Avenue) located immediately north of the proposed development site. The road comprises tarmacadam and concrete verges.

The habitat was assessed as being of Local Importance (lower value).

12.5.2.4 Dry Meadows and Grassy Verges (GS2)

The proposed construction compound and laydown area currently comprises dry meadow (GS2) (refer to Photo 2). Plant species recorded within the grassland include Yorkshire-fog (*Holcus lanatus*), smooth-meadow grass (*Poa pratensis*), cock's foot (*Dactylis glomerata*), white clover (Trifolium *spp.*) nettle (*Urtica dioica*) and ribwort plantain.

The habitat was assessed as being of Local Value (lower value).

Photo 2: Dry Meadow at the Proposed Construction Compound

12.5.2.5 Hedgerow (WL1) and Treeline (WL2)

A hedgerow (WL1) and treeline (WL2) were recorded along the eastern boundary of the construction compound. They are separated from the dry meadow by a drainage ditch that runs parallel. The hedgerow is roughly 4m in height and starts at the north-eastern corner of the construction compound. The hedgerow then transitions into a treeline, ranging between 5-8m in height, along the border of the construction compound. Both features are dominated with hawthorn (*Crataegus monogyna*) with abundant ash (*Fraxinus excelsior*), bramble (*Rubus fruticosus*) and ivy (*Hedera hibernica*) also present. Both the sections of hedgerow and treeline are well established and dense, with no signs of management.

The well-established and dense nature of the hedgerow and treeline are likely to provide important nesting and foraging habitat for bird species as well as important foraging and commuting habitats for bat species.

Both the hedgerow and treeline habitats were assessed as being of Local Importance (higher value).

Photo 3: Treeline Along the Eastern Boundary of the Construction Compound

12.5.2.6 Depositing Lowland River (FW2)

The Baldonnell Stream (Liffey_170) is located approximately 120m east of the proposed development site. The watercourse flows in a north-westerly direction before discharging into the Grifeen River located approximately 2km downstream of the proposed development site. Within the study area, the Baldonell Stream is approximately 1m wide with steep banks ranging between 4 to 5m in height. Rock gabion baskets are present along the lower section of the stream bank.

The watercourse has a slow flow and is heavily overgrown with mats of watercress *(Nasturtium officinale),* brooklime *(Veronica beccabunga)* and soft rush (*Juncus effusus*). The stream substrates consist of fine sediment (70%) with some small pebbles (30%) present in areas. The stream has been heavily modified and is culverted to the south of the site underneath the adjacent development, Digital Realty Profile Park, and is also culverted underneath the road located immediately north-east of the proposed development site and again underneath Profile Park Road located approximately 165m north of the proposed development site. The stream at this location was assessed as having low fisheries value due to the heavily modified nature of the watercourse, the presence of culverts and the high level of sedimentation present.

No evidence of otter, including holts and resting sites, were recorded along the watercourse, both 150m upstream and downstream of the proposed development. Considering the highly modified nature of the watercourse, it is likely that the stream, at this location, provides only sub-optimal habitat for otter. In addition, no suitable nesting habitat to support kingfisher was identified along the stream within the proposed development study area.

As noted in Section 12.5.1.10, otter, kingfisher and grey wagtail have all previously been recorded within Baldonnell Stream approximately 900m downstream of the proposed development site (Marston Planning Consultancy, 2020).

The watercourse was assessed as having Local Importance (higher value) as although the stream is considered to be of low ecological value at the proposed development site location, the stream supports a number of protected species further downstream.

12.5.2.7 Drainage Ditch (FW4)

A drainage ditch runs along the eastern boundary of the proposed construction compound site, parallel to the hedgerow and treeline. The drainage ditch is heavily overgrown with vegetation which included plant species such as willowherb (*Chamaenerion angustifolium*), bramble, soft rush, ivy and several grass species. The drainage ditch was largely dry, with small pockets of stagnant water present in areas. Although none were recorded, there is potential that the drainage ditch might support common frog (*Rana temporaria*).

The habitat was assessed as being of Local Value (higher value).

Photo 4: Drainage Ditch Located at the Eastern Boundary of the Construction Compound

6°27'0"W
6°26'40"W
6°26'20"W
53°19'0"N
53°18'40"N
730800
730600
730400
730200
703200
703600
704000
N

Legend

- Planning Application Boundary

Habitats

- FW4 - Drainage ditches
- WL1 - Hedgerows
- WL2 - Treelines
- BL3 - Buildings and artifical surfaces
- ED1 - Exposed sand, gravel or till
- GS4/ED2 - Mosaic of Wet Grassland and Spoil and bare ground
- ED3 - Recolonising bare ground
- GS2 - Dry meadows and grassy verges
- WS1 - Scrub

0 50 100 150 200
Meters

NOTES

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

Rev	Date	Description	By	Chkd.
A	23/05/2023	Final issue	S.P	C.N

Client: Greener Ideas

Project:
Profile Park power plant - Substation Application

Title:
Figure 12-2:
Habitats Map

Scale @ A3: 1:3,000

Prepared by:	Checked by:	Date:
S.Pezzetta	C.Naughton	May 2023

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Map Ref: 11069-004-HAB-S.BO-TOB-A

Draft: A

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Source: Esri, Maxar, Earthstar Geographics, and the GIS

12.5.2.8 Fauna

Results of protected fauna species recorded during the field surveys is provided hereunder.

12.5.2.9 Badger

Badgers and their setts are protected under the Wildlife Acts.

No evidence of badger, including their setts, were recorded within the proposed development site boundary, or within a 150m buffer of the development site. There are no hedgerows, treelines or embankments present within the proposed Baldonnell substation site that are the favoured habitat for the establishment of setts by badgers (Smal, 1995 & Byrne *et al.*, 2012). Additionally, there have been no previous records of badger recorded within the site. Therefore, badger are not considered a KER.

12.5.2.10 Otter

Otters and their breeding and resting places are protected under the Wildlife Acts and under the EU Habitat Directive.

An otter survey was undertaken along the Baldonnell Stream, within the proposed development site and 150m upstream and downstream. No evidence of otter or their resting or breeding sites were recorded during the survey. Otter are unlikely to commute and forage along the section of the Baldonnell Stream located in proximity to the proposed development site due to the highly modified nature of the watercourse and the large sections of culverts present both upstream and downstream. There is potential however that otter may occur further downstream. As noted in Section 12.5.1.10, Scott Cawley recorded an otter swimming in the Baldonnell Stream at a location approximately 600m north-west of the proposed development site (Marston Planning Consultancy, 2020).

The local otter population located downstream are assessed as being of Local Importance (higher value).

12.5.2.11 Bats

All bat species and their roost sites are protected under the Wildlife Acts. There is additional protection for lesser horseshoe bat *(Rhinolophus ferrumequinum)* which is listed as an Annex II species under the EU Habitats Directive.

No bat roost features were recorded within the proposed development site. A well-established hedgerow and treeline occurs along the eastern boundary of the proposed construction compound. None of the trees within the hedgerow and treeline were identified as having bat roost potential, however there is potential that bats may forage or commute along this hedgerow and treeline.

The local population of bat was assessed as being of Local Importance (higher value).

12.5.2.12 Other Small Mammals

There is potential that the proposed development site may support other smaller protected mammal species such as hedgehog, pygmy shrew, Irish stoat and Irish hare. No evidence of the above listed species, or any other protected mammal species were recorded during the field

surveys, however, the grassland habitats within the proposed development site may be utilised by these species, at least on occasion.

The local small mammal population was assessed as being of Local Importance (higher value).

Evidence of fox, which included tracks and scat, was recorded to the west of the proposed development site. Fox are not currently protected under National law, however there is an obligation to protect biodiversity within Ireland under the Convention on Biological Diversity.

12.5.2.13 Birds

All wild birds and their nests are protected under the Wildlife Acts. Additionally, a number of bird species are also protected under the EU Birds Directive (79/409/EEC).

During the walkover survey a single buzzard (*Buteo buteo*) was recorded soaring over the proposed development site. Buzzard are Green Listed in Ireland (Gilbert *et al.*, 2021).

Other evidence of bird activity included tracks, likely belonging to snipe (refer to Photo 5), recorded immediately east of the proposed development site. Snipe have previously been recorded using the site and surrounding area (TOBIN, 2021). Snipe are Red Listed in Ireland (Gilbert *et al.*, 2021).

As noted, in Section 12.5.1.10, a lapwing nest with eggs was identified in close proximity to the proposed development during a survey undertaken in 2021 (TOBIN, 2021). As the ecology survey for the proposed development was undertaken in winter, breeding activity by lapwing could not be established. However, the previous record of a nest within the area, suggests the proposed development site is likely to provide suitable nesting habitat for lapwing. Lapwing are Red Listed and exhibit a continued severe population decline in Ireland (Gilbert *et al.,* 2021).

The local breeding and wintering bird population was assessed as being of Local Importance (higher value).

Photo 5: Possible Snipe Tracks

12.5.2.14 Herpetofauna and Reptile Species

The Wildlife Acts provides protection to Ireland's only reptile; common lizard *(Zootoca vivipara)* and two amphibian species, common frog and smooth newt *(Lissotriton vulgaris).*

No suitable habitat to support common lizard, or smooth newt was recorded within the proposed development site. Baldonnell Stream and the drainage ditch, however, are likely to provide some suitable habitat for common frog.

Local common frog population are assessed as being of Local Importance (higher value).

12.5.2.15 Aquatic Species

The Baldonnell Stream was assessed as having no suitable habitat to support protected fish species, white-clawed crayfish or lamprey species. The stream at this location was assessed as having low fisheries value due to the heavily modified nature of the watercourse, the presence of culverts and the high levels of sedimentation present. Further downstream however, within the Grifeen River, the fish species; three-spined stickleback, brown trout, and eel are known to occur (IFI, 2019[7]).

The downstream fish population was assessed as being of Local Importance (higher value).

12.5.3 Summary of Ecological Evaluation

Following a review of the existing environment presented above, KERs within the ZoI of the proposed development site were evaluated in accordance with the evaluation criteria set out in Table 12-1 and Table 12-2 Table 12-2 above. Consideration of the existing baseline condition / population stability, conservation status, rarity and legal protection of the KERs was

undertaken. A summary of the ecological valuation and identification of KERs is provided in In line with the NRA guidance (NRA, 2009), identified ecological features which are assessed as being below Local Importance (higher value) are not selected as KERs.

Table 12-6. In line with the NRA guidance (NRA, 2009), identified ecological features which are assessed as being below Local Importance (higher value) are not selected as KERs.

Table 12-6: Summary of Key Ecological Receptors

Site/Habitat/Species	NRA Ecological Evaluation	KER	Rationale for Inclusion
Designated Sites			
South Dublin Bay SAC (000210)	International	Yes	Hydrological connectivity was identified between the proposed development site and the SAC.
South Dublin Bay and River Tolka Estuary SPA (004024)	International	Yes	Hydrological connectivity was identified between the proposed development site and the SPA.
North Dublin Bay SAC (000206)	International	Yes	Hydrological connectivity was identified between the proposed development site and the SAC.
North Bull Island SPA (004006)	International	Yes	Hydrological connectivity was identified between the proposed development site and the SPA.
All other European Sites	International	No	No source-pathway-receptor links exist.
Liffey Valley pNHA (000128)	National	Yes	Hydrological connectivity was identified between the proposed development site and the pNHA.
South Dublin Bay pNHA (000210)	National	Yes	Hydrological connectivity was identified between the proposed development site and the pNHA.
North Dublin Bay pNHA (000206)	National	Yes	Hydrological connectivity was identified between the proposed development site and the pNHA.
Dublin Docks pNHA (000201)	National	Yes	Hydrological connectivity was identified between the proposed development site and the pNHA.
All other nationally designated sites	National	No	No source-pathway-receptor links exists.
Habitats and Flora			
Mosaic of wet grassland (GS4) and spoil and bare ground (ED2)	Local Importance (higher value)	Yes	The proposed development will result in the permanent loss of habitat. The habitat may support a number of protected bird species.
Depositing/ lowland rivers (FW2)	Local Importance (higher value)	Yes	The watercourse supports protected species downstream and occurs within the ZoI of the proposed development.
Dry meadow (GS2)	Local Importance (lower value)	No	Habitat is of Local Importance (lower value) and is therefore not considered a KER.
Building and artificial surfaces (BL3)	Local Importance (lower value)	No	Habitat is of Local Importance (lower value) and is therefore not considered a KER.
Hedgerows (WL1) and treelines	Local Importance (higher value)	No	The proposed development will not result in the loss of the habitat.
Drainage ditches (FW4)	Local Importance (higher value)	Yes	The watercourse occurs within the ZoI of the proposed development.
Fauna			
Otter	Local Importance (High value)	Yes	Hydrological link. Potential for indirect effect via a degradation in water quality.

Site/Habitat/Species	NRA Ecological Evaluation	KER	Rationale for Inclusion
Badger	Local Importance (High value)	No	Unlikely to occur within ZoI of the proposed development site.
Other small, protected mammal species	Local Importance (High Value)	Yes	Potential for the construction works to result in the disturbance of small, protected mammal species.
Breeding and wintering bird species	Local Importance (High value)	Yes	Potential for the construction works to result in the disturbance of breeding/wintering bird species.
Amphibian species	Local Importance (High value)	Yes	Potential for the construction works to result in impacts on protected amphibian species.
Fish species	Local Importance (High value)	Yes	Hydrological link. Potential for indirect impacts via a degradation of water quality.

12.6 IMPACT ASSESSMENT

The following sections present the assessment of impacts (likely significant effects) on biodiversity within the ZoI of the proposed development. Likely significant effects are presented in relation to the construction, operational and decommissioning phases of the proposed development. The likely significant effects described in this section are the ecological impacts predicted due to the proposed development prior to the consideration of any appropriate mitigation measures (refer to Section 12.7 for further details on mitigation measures). As per NRA guidance (NRA, 2009), likely significant effects have only been assessed for KERs as listed in Table 12-6. Residual effects describe potential effects that remain after all impacts and mitigation measures are considered.

12.6.1 Do Nothing Effects

If the proposed development does not take place (do nothing scenario) the existing baseline conditions detailed within Section 12.5 are expected to remain. The proposed development site will continue to contain habitats and species currently present within the study area and will continue to recolonise naturally.

12.6.2 Assessment of Impacts on Designated Sites

12.6.2.1 European Sites

TOBIN prepared an AA Screening Report (which accompanies this EIAR in the Planning Application package) which assessed the potential for the proposed development to have likely significant effects on European sites(s) either alone or in-combination with other plans and projects. The AA Screening Report identified a hydrological pathway between the proposed development and four European sites, namely; South Dublin Bay SAC, South Dublin Bay and River Tolka Estuary SPA, North Dublin Bay SAC and North Bull Island SPA. The AA Screening Report concluded that despite the hydrological connectivity, there is no potential for the proposed development to result in likely significant effects on the qualifying interests/special conservation interest of the four European sites, due to; the separation distance (ca. 120m) between the proposed development site and Baldonell Stream, the lack of any instream works within the watercourse, the significant downstream hydrological distance to the European sites (ca. 30km), coupled with the small scale and temporary nature of the proposed construction works associated with the proposed development.

The screening assessment concluded that the proposed development, either alone or in-combination with other plans and projects, will not result in likely significant effects on any European site, in view the conservation objectives of the site, and therefore a stage 2 Appropriate Assessment was not required.

12.6.2.2 National Sites

The proposed development is also hydrologically linked to four nationally designated sites; Liffey Valley pNHA, South Dublin Bay pNHA, North Dublin Bay pNHA and Dublin's Docks pNHA, via the Baldonnel Stream and River Liffey. The four sites are located within the same setting as the above-mentioned Dublin Bay European sites.

Due to the similar location of the national sites to the above mentioned European sites, there is similarly no potential for water quality impacts on the sites due to the lack of instream works, the separation distance (ca. 120m) between the proposed development site and the Baldonnel Stream, the downstream hydrological distance (ca. 30km), coupled with the small scale and temporary nature of the proposed construction works associated with the proposed development. No impacts on the four pNHA sites are anticipated.

No viable source-pathway-receptor links were identified between the proposed development site and any other site of Nature Conservation. Thus, there is no potential for impacts on any nationally protected sites.

12.6.3 Construction Phase Impacts

Impacts associated with the construction phase on the receiving environment are discussed hereunder.

12.6.3.1 Impacts to Habitats and Flora

12.6.3.2 Habitat Loss

The overall proposed development site is approximately 2.6 (ha) in size and will result in the permanent loss of habitat of a similar footprint.

The development of the proposed substation will result in a permanent loss of approximately 0.2ha of the mosaic habitat comprised of wet grassland and bare ground. The temporary construction compound will result in a temporary loss of approximately 1.2ha of dry meadow habitat. Following the completion of the construction phase, the construction compound infrastructure will be dismantled and removed offsite. No areas of treeline or hedgerow will be removed to facilitate the proposed development. No other areas of habitat will be lost to facilitate the proposed development.

Although the mosaic habitat of wet grassland may support some protected bird species such as snipe and lapwing, the habitat is generally considered to be of low value due to the low species diversity and disturbed nature of the habitat. Wet grassland habitat is common and widespread within the surrounding environment, and as such, the loss of the habitats will not result in significant effects on the receiving environment. Similarly, dry meadow habitat is widespread and commonly found within the wider environment.

The permanent loss of habitat within the proposed development site during the construction phase would result in a **permanent, imperceptible, negative effect** on wet grassland and spoil and bare ground habitat at a local geographical scale.

12.6.3.3 Habitat Degradation due to Water Quality Impacts

During the construction phase of the proposed development, there is the risk for accidental spills and leaks of oils, fuels and chemicals from storage areas, plant and equipment to impact surrounding habitats. The pouring of concrete will be required to facilitate the foundation works associated with the development. In addition, site clearance, excavation activities and the stockpiling of material have the potential to result in the runoff of sediment if not appropriately managed. The Baldonnell Stream is located approximately 120m east of the proposed works. Despite the setback distance, the risk of sediment and contaminated runoff discharging to the watercourse cannot be ruled out.

The release of contaminates and increased silt loading in watercourses can stunt aquatic plant growth, limit dissolved oxygen capacity and overall reduce the ecological quality of watercourses, with the most critical period associated with low flow conditions.

Therefore, water quality impacts on the Baldonnell Stream could result in **short-term, slight negative effects** on aquatic KERs present, at a **local geographical scale.**

12.6.3.4 Habitat Degradation due to Air Quality Impacts (Dust)

Construction activities, such as excavation works, moving of material and trackout[8], can result in the generation of dust. The deposition of dust on flora or habitats can inhibit effective photosynthesis and transpiration (Farmer, 1993). The Institute of Air Quality Management provide guidelines; *'Guidance on the Assessment of Dust from Demolition and Construction'* (Holman *et al.*, 2014), which prescribes potential dust emission risk classes to ecological receptors (i.e. habitats that might be sensitive to dust). Following the guidance characterisation, considering the size of the proposed development, the scale of the earthworks were considered 'Small' (total site area <2,500m^2), with less than five earth moving vehicles at one time. The guidelines also indicate that an assessment will be required where there is 'an ecological receptor within 50m of the boundary of a site; or 50m of the route(s) used by construction vehicles'.

There are no ecological receptors within 50m of the proposed development. Habitats within 50m of the proposed development were all assessed as being of Local Importance, and there are no protected habitats located within 50m of the proposed development site. Dust impacts are therefore likely to result in a **short-term, imperceptible negative effect** on the KER habitats at a **local geographic scale**.

12.6.3.5 Habitat Degradation due to dispersion of Invasive Plant Species

No non-native invasive plant species listed under Part 1 of the Third Schedule of S.I No. 477 of 2011 were recorded within the proposed development site during the field surveys. There is potential, however, for the construction works to result in the introduction of invasive non-native species if not appropriately managed. The effects of introducing non-native invasive plant species to ecologically important habitat areas during the construction works, have the potential to result in **medium term, slight negative effects** on KER habitats at a **local geographic scale**.

[8] Trackout – the transport of dust and dirt from the construction site onto the public road network.

12.6.3.6 Impacts to Fauna

Potential construction phase impacts on fauna within the receiving environment is discussed hereunder.

12.6.3.7 Otter

Loss of Habitats

No evidence of otter, including otter holts or layups/couches, were recorded along the Baldonnell Stream within the ZoI of the proposed development. No instream works will occur within the Baldonnell Stream. The proposed works will not result in any loss of important habitat for otter.

Disturbance/displacement

Construction works can result in disturbance impacts for otter to a distance of up to 150m, as per the NRA guidelines (NRA, 2006a). As noted, no otter holts or couches were identified within the ZoI of the proposed development site. In addition, Baldonnel Stream was identified as being sub-optimal for otter, due to the modified nature and low fishery value of the watercourse. There is therefore no potential for direct disturbance of otter during the construction works.

There is potential, however, that water quality impacts within Baldonnell Stream may negatively impact otter which forage further downstream. Chanin (2003) notes that '*Otters are not directly affected by water quality and will forage in conditions that seem extremely unpleasant to humans, however, where deterioration in water quality leads to a deterioration in food supply there will clearly be an indirect effect*'.

A degradation of otter feeding resources located downstream would constitute a **short-term, slight negative effect** on otter at a **local geographical scale**.

12.6.3.8 Other Mammal Species

There is potential that the proposed development site may support other small, protected mammal species such as hedgehog, pygmy shrew or Irish hare. However, considering the availability of higher valuable habitat within the surrounding environment and the lack of evidence of such species within the site, it is considered that the proposed development site is unlikely to support significant numbers of protected small mammals.

The proposed construction works have the potential to result in the loss of habitat and disturbance of such species. However, given the low number of species likely to be using the site and the mobile nature of these species, the clearance of vegetation and disturbance is likely to result in **short-term, slight, negative effects** on the local population of small mammal species, at a **local geographical scale**.

12.6.3.9 Breeding and Wintering Bird Species

Loss of Habitat

The proposed construction works will result in the permanent loss of approximately 0.2ha of habitat which currently comprises a mosaic of wet grassland and bare ground. The areas of undisturbed wet grassland may provide some suitable habitat for ground nesting bird species. However, considering the small area of habitat which will be lost and the availability of

alternative habitat within the surrounding area, the loss of 0.2ha habitat is unlikely to significantly impact local bird populations.

The loss of habitat is likely to have a **permanent, imperceptible, negative effect** on the local bird population at a **local geographical scale.**

Disturbance/displacement

Construction related noise and the physical presence of machinery and construction personnel can result in the disturbance of birds from habitats located in close proximity to the proposed development site. The proposed construction works may result in short-term disturbance to breeding and wintering bird species which forage within the surrounding area; however, considering the small scale and short-term nature of the proposed development, it is likely that birds will acclimatise to human presence over time.

The disturbance of bird species is likely to have a **short term, imperceptible effect** on the local bird population at a **local geographical scale.**

12.6.3.10 Fish and Aquatic Species

The Baldonnell Stream is likely to support common frog in proximity to the proposed development site and fish species further downstream. The proposed construction works have the potential to result in a degradation of water quality, in the absence of mitigation measures. A degradation in water quality has the potential to result in **short-term, slight, negative effect** on fisheries and the local frog population at a **local geographical scale**.

12.6.4 Operational Phase Impacts

Details of the operational phase of the proposed development can be found in Chapter 3 (Description of the Development). Impacts on biodiversity associated with the operational phase are discussed hereunder.

12.6.4.1 Habitat Degradation due to Surface Water Quality Impacts

Stormwater

Surface water runoff will be generated from all surfaces within the facility that are exposed to rainwater or to which water is applied in order to clean. All surface water will be collected and will discharge to the proposed soakaway. When the rate of water being collected by the underground pipes exceeds the infiltration rate into the ground, the collected water will then be directed to an overflow pipe which will discharge the excess water into the surface water infrastructure in the neighbouring Gas Fired Plant. Considering the above there is no potential for the stormwater to negatively impact surface water quality in the receiving environment.

Foul Water

Although the proposed substation will be unmanned, any wastewater generated at the proposed development site will arise from a welfare facility, consisting of a sink and toilet for operatives use when on site.

It is proposed to discharge wastewater generated on the site into the permitted new infrastructure on the neighbouring Power Plant site, reducing the number of connections required into the existing network within the Profile Park Campus Falcon Avenue access road. The wastewater layout has been designed in accordance with Irish Water's latest standard

details and code of practice. Thus, there is no potential for water quality impacts from foul water on the receiving environment.

Process Wastewater

There will be no process wastewater generated from the proposed development. Thus, there is no potential for water quality impacts from foul water on the receiving environment.

Maintenance Works

Operational access will be required to the proposed development site for testing, maintenance and deliveries. There will be occasional site visits to the substation site which may lead to occasional accidental emissions, in the form of oil, petrol or diesel leaks, which could cause localised contamination of site drainage/ surface water features, i.e., Baldonnell Stream.

The occasional site visits to the proposed development has the potential to result in **long-term, slight negative effects** on the receiving environment at a **local geographical scale**.

12.6.4.2 Disturbance (Noise and Lighting)

The proposed substation will be operated remotely with occasional site and maintenance visits. As such there will be a minimal increase in vehicular movements to the site and no associated increase in noise, dust or emissions.

During the operational phase, there are no predicted direct noise or vibration impacts from the redeveloped substation, as outlined in Chapter 11 Noise and Vibration. The only operational phase noise from the proposed substation redevelopment will be vehicle noise associated with maintenance visits to the site which will be irregular.

Permanent lighting is proposed within the proposed development with an activation switch. Lighting will only be switched on when maintenance staff are present on site.

Disturbance during the operational phase of the proposed development has the potential to result in **long-term, imperceptible, negative effects** on the local fauna at a **local geographical scale**.

12.6.5 Decommissioning Phase Impacts

The proposed Baldonnell 110kV substation is expected to be operational in accordance with the adjacent gas fired plant. The power plant is expected to be operational for at least 25 years. Impacts during the decommissioning phase are expected to be of similar type and magnitude to those anticipated during the construction phase, but generally of a shorter duration.

12.7 MITIGATION MEASURES

Mitigation measures which will be employed to ensure no significant effects on biodiversity occur as a result of the proposed development, are described hereunder.

Mitigation is prescribed with regard to the 'Mitigation Hierarchy' set out in the EPA '*Guidelines on the Information to be Contained in Environmental Impact Assessment Reports'* (EPA 2022), which requires mitigation by avoidance as a first approach. Where this is not achievable, measures to prevent impacts from giving rise to adverse effects will be adopted. Where impacts cannot be avoided (e.g. generation of noise), mitigation by reduction of impact is prescribed to

limit the exposure of the ecological receptor to an acceptable level (often achieved by interrupting the pathway between the source and receptor). When significant effects cannot be prevented, mitigation to counteract the effects is required (i.e. offsetting measures).

12.7.1 Construction Phase Mitigation Measures

Mitigation measures which will be implemented during the construction phase are detailed hereunder.

12.7.1.1 Construction Environmental Management Plan

A Construction Environmental Management Plan (CEMP) has been prepared and is included within this Planning Application. All mitigation measures outlined within this chapter will be included within the CEMP. The CEMP is included in Appendix 3-2 of this EIAR.

12.7.1.2 Appointment of Environmental / Ecological Clerk of Works

A suitably qualified Ecological Clerk of Works (ECoW) will be appointed by the appointed Contractor. The ECoW will oversee all construction works and monitor any possible sources for impacts for the duration of the construction programme. The ECoW will inspect the construction phase of the proposed development is undertaken in strict agreement with the methods prescribed within the CEMP and will have the power to stop the works in case any activities/works are not compliant.

12.7.1.3 Pre-construction Botanical Survey

A pre-construction botanical survey will be carried out within the optimal survey period (April to September) prior to construction works commencing. The survey will be required to determine the presence of any protected or invasive flora, which may occur in the intermediate time or which may have been missed during the initial botanical survey undertaken outside the optimal survey period. In the event that a Flora Protection Order (FPO) or Red Listed plant species is identified within the footprint of the works area, appropriate mitigation such as translocation will be implemented. In the event that an invasive plant species, listed in Part 1 of the Third Schedule of S.I No. 477/2011 – European Communities (Birds and Natural Habitats) Regulations 2011 is recorded, a site-specific Invasive Species Management Plan will be prepared. Further details on the management of invasive species and pathogens are outlined in Section 12.7.1.56.

12.7.1.4 Clearance of Vegetation

The proposed construction work areas will be demarcated prior to construction works commencing. No clearance of vegetation will be undertaken outside of the demarcated areas within the proposed development site. Construction vehicles will be restricted to designated access tracks to avoid impacting adjacent habitats and to ensure that soil compaction is restricted to these tracks. All temporary disturbed ground will be fully reinstated following the completion of the works.

12.7.1.5 Management of Invasive Species and Pathogens

In order to comply with Regulations 49 and 50 of the European Communities (Birds and Natural Habitat) Regulations (2011), the appointed Contractor will ensure biosecurity measures are implemented throughout the construction phase to prevent the introduction and translocation of invasive species.

The following mitigation measures are prescribed to control the translocation or spread of invasive species and / or pathogens:

- No invasive plant species were recorded within the proposed development, however in the event that proposed construction works are delayed more than 18 months, a pre-construction invasive species survey will be undertaken. In the event that an invasive plant species, listed in Part 1 of the Third Schedule of S.I No. 477/2011 – European Communities (Birds and Natural Habitats) Regulations 2011 is recorded, a site-specific Invasive Species Management Plan (ISMP) will be prepared.
- Prior to arrival all machinery and equipment used during the construction works will be thoroughly cleaned and then dried using a high-pressured steam cleaning, with water >65 °C, in addition to the removal of all vegetation material. Disinfectant, such as a Virkon® Aquatic solution, will be used. The appointed Contractor will establish and clearly delineate a bunded cleaning/washing area.
- No removed material or run-off will be allowed to enter any water bodies (e.g. Baldonnell Stream).
- Evidence that all machinery and equipment has been cleaned will be required to be on file for review by the statutory authorities and the appointed ECoW.

12.7.1.6 Protection of Baldonnell Stream

Measures to prevent accidental spillage/leakage of chemicals and pollutants and uncontrolled runoff of contaminated surface water and sediment are outlined in Chapter 8 - Land, Soils and Geology and in Chapter 9 - Hydrology and Hydrogeology. The implementation of these control measures will ensure that there is no potential for impacts to ecological receptors in the receiving environment. A summary of the sediment and pollution control measures which will be implemented are provided hereunder.

Silt fences will be installed along the eastern boundary of the proposed development to ensure there is no runoff into Baldonnell Stream. Silt fences will be constructed using a permeable filter fabric (Hy-Tex Terrastop Premium silt fence or similar), which will be installed as per the manufacturer's guidelines and will be maintained until vegetation on the disturbed ground has been re-established. Once installed, the silt fence will be inspected regularly (daily) during construction and more frequently (hourly) during heavy rainfall (i.e., if there is a yellow weather warning in place or if the rainfall is greater than 5mm in a 1-hour period).

All concrete will be mixed off site and poured in place at site. All concrete browsers will be washed down at a dedicated concrete washout onsite located within the construction compound or offsite. Concrete washings will not be disposed of onsite to any surface or ground water features. All washings will be removed offsite and treated at a licensed facility. No chemicals that are deleterious to aquatic organisms will be used in cleaning works. All raw, uncured waste concrete must be cured at a designated location within the construction compound or offsite.

Re-fuelling of construction equipment and the addition of hydraulic oil or lubricants to vehicles / equipment will take place in designated hard surface, bunded areas within this construction compound or offsite only. If it is not possible to bring machinery to the refuelling point, fuel will be delivered in a double-skinned mobile fuel bowser. A drip tray will be used beneath the fill point during refuelling operations in order to contain any spillages that may occur. Refuelling will only occur within the construction compound or offsite.

12.7.1.7 Protection of Nesting Birds

The area which provides suitable bird nesting habitat (i.e. wet grassland) will not be removed, cleared or trimmed between the 1st March and 31st August, to avoid impacts on nesting birds protected under the Wildlife Acts and/or Birds Directive. Where the construction programme does not allow this time restriction to be observed, then these areas will be inspected by a qualified ecologist for the presence of breeding birds prior to commencement of the construction works. Where any nests are found, the appointed ECoW will provide recommendations as to whether a licence is required for vegetation removal and will detail the process for obtaining such derogation from the NPWS.

12.7.2 Operational Phase Mitigation

Mitigation measures which will be implemented during the operational phase are detailed hereunder.

12.7.2.1 Surface Water Mitigation

During the operational phase, site personnel will follow best practice measures as outlined in Chapter 9 – Hydrology and Hydrogeology when undertaking site visits and maintenance works.

12.7.2.2 Lighting

All new lighting proposed at the substation site will be designed in accordance with the Bat Conservation Ireland guidelines '*Bats and Lighting Guidance Notes: Planners, Engineers, Architects and Developers'* (BCI, 2010). Lighting will only be switched on when manned; it should be noted the proposed development will comprise a generally unmanned facility. Light shields and directional lighting will be used to minimise light spill. All lighting will be directed away from Baldonnell Stream and away from treelines and hedgerows.

12.7.3 Decommissioning Phase Mitigation Measures

Impacts during the decommissioning phase are expected to be of similar type and magnitude to those anticipated during the construction phase, but generally of a shorter duration. Therefore, the same mitigation measures implemented during the construction phase, will be applied during the decommissioning works.

12.8 CUMULATIVE EFFECTS

Cumulative effects are defined in the EPA (2022) guidance as "*The addition of many minor or insignificant effects, including the effects of other projects, to create larger, more significant effects*".

Information on relevant projects within proximity to the proposed development is described in Chapter 6 - Planning. The information was sourced from a search of the local authorities planning registers, the EPA website, planning applications, EIAR documents and planning drawings, which facilitated the identification of past and future projects, their activities and their potential environmental impacts. All projects listed in Chapter 6 were reviewed as part of the cumulative effects assessment. Key projects with the potential for cumulative effects on Biodiversity are described further below.

12.8.1 Projects

Profile Park Power Plant (Planning Ref: SD21A/0167)

Green Ideas Limited have been granted planning for the development of a 125 MW dual fuel gas fired power plant located immediately east of the proposed Baldonnell substation. The gas fired power plant was subject to an EIA which included an ecological impact assessment.

The EIA report concluded that following the implementation of the mitigation measures there is no potential for the gas fired power plant to result in significant negative effects on the receiving biodiversity and there is no potential for residual impacts (TOBIN, 2021). There is therefore no potential for cumulative negative effects on biodiversity with the proposed development under appraisal in this report.

Kilcarbery Substation (Planning Ref: 312793)

Vantage Data Centers Dublin 11 Limited are seeking permission for the development of the Kilcarbery Substation and Transmission Line located immediately west of the proposed substation site. An EIAR of the proposed Kilcarbery substation was prepared and included an ecological impact assessment. The EIAR concluded that the proposed Kilcarbery substation would not result in any likely significant effects on the receiving biodiversity and there was no potential for residual effects. Considering the above, there is therefore no potential for cumulative negative effects on biodiversity with the proposed development under appraisal in this report.

12.8.2 Plans

The South Dublin Development Plan 2022-2028[9] indicates that the proposed development site is located within Enterprise and Employment zoned lands. The development plan indicates that Enterprise and Employment zoned lands will accommodate low to medium intensity enterprise employment uses.

The County Development Plan also indicates policies and objectives associated with the protection of biodiversity and European sites (Objectives: NCBH2, NCBH3, NCBH4, NCBH5, etc.). All new plans and projects proposed within the local administrative area must adhere to the above-mentioned objectives. Adherence to the Council's policies and objectives will therefore ensure that all plans and projects proposed within the area will not result in significant effects on biodiversity and international and national sites. There is, therefore, no potential for significant cumulative effects on biodiversity with the proposed development.

12.9 RESIDUAL EFFECTS

The design of the proposed development has considered the existing ecological conditions within the receiving environment. It is anticipated that with the implementation of mitigation measures (as outlined above), the construction, operational and decommissioning phases of the proposed development, will not result in significant residual effects on biodiversity. This conclusion is further described hereunder.

[9] Accessed [January 2023] via: https://www.sdcc.ie/en/devplan2022/adopted-plan/county-development-plan-written-statement/county-development-plan-written-statement.pdf

12.9.1 Construction Phase

The proposed development will result in a permanent loss of habitat, approximately 0.2ha in size. Considering the small area of habitat which will be permanently lost, and the availability of alternative, similar habitat in the surrounding area, the permanent loss of the habitat will not result in significant effects on the receiving environment. In addition, with the proposed construction related mitigation measures as outlined above, the existing biodiversity can be protected. Mitigation measures are based on best available scientific evidence, therefore confidence can be placed in their likely success. Thus, there will be no significant residual effects arising from the construction phase of the proposed development.

12.9.2 Operational Phase

With the proposed mitigation measures in place (as outlined above), the existing biodiversity can be protected. Mitigation measures are based on best available scientific evidence, therefore confidence can be placed in their likely success. Thus, there will be no significant residual effects arising from the operational phase of the proposed development.

12.9.3 Decommissioning Phase

Due to the limited extent of the works required for decommissioning, and the implementation of the mitigation measures listed above, the existing biodiversity can be protected. Mitigation measures are based on best available scientific evidence, therefore confidence can be placed in their likely success. Thus, there will be no significant residual effects arising from the decommissioning phase of the proposed development.

12.10 REFERENCE

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13.0 CULTURAL HERITAGE

13.1 INTRODUCTION

IAC Archaeology has prepared this chapter to assess the impact, if any, on the archaeological and cultural heritage resource of a proposed development at Profile Park. The assessment determines, as far as reasonably possible from existing records, the nature of the archaeological and cultural heritage resource in and within the vicinity of the proposed development area using appropriate methods of study. An impact assessment was undertaken to identify potential adverse impacts that the proposed development may have on the cultural heritage resource, while the mitigation strategy is designed to avoid, reduce, or offset such adverse impacts.

13.1.1 Statement of Authority

This assessment was completed by Faith Bailey who is an Associate Director and Senior Archaeologist and Cultural Heritage Consultant with IAC Archaeology. Faith holds an MA in Cultural Landscape Management (archaeology and built heritage) and a BA in single honours archaeology from the University of Wales, Lampeter. She is a licence-eligible archaeologist, a member of the Chartered Institute for Archaeologists, a member of the Institute of Archaeologists of Ireland and has over 19 years' experience working in the commercial archaeological and cultural heritage sector.

13.2 METHODOLOGY

13.2.1 Definitions

To assess, distil and present the findings of this study, the following definitions apply:

- 'Cultural Heritage' where used generically, is an over-arching term applied to describe any combination of archaeological, architectural, and cultural heritage features, where –the term 'archaeological heritage' is applied to objects, monuments, buildings or landscapes of an (assumed) age typically older than AD 1700 (and recorded as archaeological sites within the Record of Monuments and Places).
- the term 'cultural heritage', where used specifically, is applied to other (often less tangible) aspects of the landscape such as historical events, folklore memories and cultural associations.

13.2.2 Legislation and Guidelines

The following legislation, standards and guidelines were consulted as part of the assessment.

- National Monuments Act, 1930 to 2014;
- The Planning and Development Acts, 2000 to 2017;
- Heritage Act, 1995, as amended;
- Draft Advice Notes on Current Practice (in the preparation of Environmental Impact Statements), 2015, EPA;
- Guidelines on the Information to be Contained in Environmental Impact Statements. Dublin. Government Publications Office, 2022, EPA;
- Frameworks and Principles for the Protection of the Archaeological Heritage, 1999, (formerly) Department of Arts, Heritage, Gaeltacht, and Islands; and

- Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act, 2000 and the Local Government (Planning and Development) Act 2000.

13.2.3 Consultation

During scoping and research for the assessment and EIAR, of the following statutory and voluntary bodies were consulted to gain further insight into the cultural background of the receiving environment and study area:

- Department of Housing, Local Government and Heritage (DoHLGH)– the Heritage Service and Policy Unit, National Monuments and Historic Properties Section: Record of Monuments and Places; Sites and Monuments Record; Monuments in State Care Database; Preservation Orders; Register of Historic Monuments;
- National Museum of Ireland, Irish Antiquities Division: topographical files of Ireland; and
- South Dublin County Council: Planning Section.

13.2.4 Paper Survey

The following sources were examined and a list of areas of archaeological and cultural heritage potential was compiled:

- Record of Monuments and Places for County Dublin;
- Sites and Monuments Record for County Dublin;
- National Monuments in State Care Database;
- Preservation Orders List;
- Register of Historic Monuments;
- Topographical files of the National Museum of Ireland;
- Cartographic and written sources relating to the study area;
- South Dublin County Development Plan (2022–2028);
- Aerial photographs;
- Excavations Bulletin (1970–2022); and
- Place Names.

Record of Monuments and Places (RMP) is a list of archaeological sites known to the National Monuments Section, which are afforded legal protection under Section 12 of the 1994 National Monuments Act and are published as a record.

Sites and Monuments Record (SMR) holds documentary evidence and field inspections of all known archaeological sites and monuments. Some information is also held about archaeological sites and monuments whose precise location is not known e.g., only a site type and townland are recorded. These are known to the National Monuments Section as 'un-located sites' and cannot be afforded legal protection due to lack of locational information. As a result, these are omitted from the Record of Monuments and Places. SMR sites are also listed on a website maintained by the Department of Housing, Local Government and Heritage (DoHLGH) – www.archaeology.ie.

National Monuments in State Care Database is a list of all the National Monuments in State guardianship or ownership. Each is assigned a National Monument number whether in guardianship or ownership and has a brief description of the remains of each Monument.

The Minister for the Department of Housing, Local Government and Heritage may acquire national monuments by agreement or by compulsory order. The state or local authority may assume guardianship of any national monument (other than dwellings). The owners of national monuments (other than dwellings) may also appoint the Minister or the local authority as guardian of that monument if the state or local authority agrees. Once the site is in ownership or guardianship of the state, it may not be interfered with without the written consent of the Minister.

Preservation Orders List contains information on Preservation Orders and/or Temporary Preservation Orders, which have been assigned to a site or sites. Sites deemed to be in danger of injury or destruction can be allocated Preservation Orders under the 1930 Act. Preservation Orders make any interference with the site illegal. Temporary Preservation Orders can be attached under the 1954 Act. These perform the same function as a Preservation Order but have a time limit of six months, after which the situation must be reviewed. Work may only be undertaken on or in the vicinity of sites under Preservation Orders with the written consent, and at the discretion, of the Minister.

Register of Historic Monuments was established under Section 5 of the 1987 National Monuments Act, which requires the Minister to establish and maintain such a record. Historic monuments and archaeological areas present on the register are afforded statutory protection under the 1987 Act. The register also includes sites under Preservation Orders and Temporary Preservation Orders. All registered monuments are included in the Record of Monuments and Places.

The topographical files of the National Museum of Ireland are the national archive of all known finds recorded by the National Museum. This archive relates primarily to artefacts but also includes references to monuments and unique records of previous excavations. The find spots of artefacts are important sources of information on the discovery of sites of archaeological significance.

Cartographic sources are important in tracing land use development within the development area as well as providing important topographical information on areas of archaeological potential and the development of buildings. Cartographic analysis of all relevant maps has been made to identify any topographical anomalies or structures that no longer remain within the landscape.

Documentary sources were consulted to gain background information on the archaeological and cultural heritage landscape of the proposed development area.

Development Plans contain a catalogue of all the Protected Structures and archaeological sites within the county. The South Dublin County Development Plan (2022–2028) was consulted to obtain information on cultural heritage sites in and within the immediate vicinity of the proposed development area.

Aerial photographic coverage is an important source of information regarding the precise location of sites and their extent. It also provides initial information on the terrain and its likely potential for archaeology. A number of sources were consulted including aerial photographs and satellite imagery held by the Ordnance Survey, Google Earth, and Bing Maps.

Excavations Bulletin is a summary publication that has been produced every year since 1970. This summarises every archaeological excavation that has taken place in Ireland during that year up until 2010 and since 1987 has been edited by Isabel Bennett. This information is vital when examining the archaeological content of any area, which may not have been recorded

under the SMR and RMP files. This information is also available online (www.excavations.ie) from 1970–2022.

Place Names are an important part in understanding both the archaeology, history, and cultural heritage of an area. Place names can be used for generations and in some cases have been found to have their root deep in the historical past. The main references used for the place name analysis is *Irish Local Names Explained* by P.W Joyce (1870) and the Place Names Database of Ireland (www.logainm.ie).

13.2.5 Field Inspection

Field inspection is necessary to determine the extent and nature of archaeological, architectural, and historical remains and can also lead to the identification of previously unrecorded or suspected sites and portable finds through topographical observation and local information.

The archaeological field inspection entailed -

- Walking the proposed development and its immediate environs.
- Noting and recording the terrain type and land usage.
- Noting and recording the presence of features of archaeological or historical significance.
- Verifying the extent and condition of any recorded sites.
- Visually investigating any suspect landscape anomalies to determine the possibility of their being anthropogenic in origin.

13.3 BASELINE ENVIRONMENT

13.3.1 Archaeological and Historical Background

The proposed development area is in the townlands of Kilbride and Aungierstown and Ballybane, Parishes of Kilbride and Kilmactalway in the Barony of Newcastle, County Dublin. There are four individual recorded monuments within 500m of the proposed development area. These comprise a castle (DU021-004) and a church, graveyard and ecclesiastical enclosure group (DU021-005001-3), located c. 427m and c. 478m to the south respectively (Figure 13 1).

Figure 133-1: Site location showing recorded monuments (Google Satellite)

13.3.1.1 Mesolithic Period (c. 8000–4000 BC)

Although recent discoveries have suggested the possibility of human activity in the southwest of Ireland as early as the Upper Palaeolithic (Dowd and Carden 2016), the Mesolithic period is the first time for which there is widespread evidence of human occupation on the island of Ireland. Mesolithic people led a mobile lifestyle, hunting, foraging and fishing for sustenance and migrating to exploit seasonal resources. As a result, coastal and riverine resources were of particular importance to these communities. Such transient ways of life leave little trace in the archaeological record. Often the only indication of Mesolithic activity is scatters of flint implements and debitage.

There is no evidence of Mesolithic activity within the vicinity of the proposed development area.

13.3.1.2 Neolithic Period (c. 4000–2500 BC)

During this period communities became less mobile, and their economy became based on the rearing of stock and cereal cultivation. The transition to the Neolithic was marked by major social change. Communities had expanded and moved to more permanent settlements. This afforded the development of agriculture which demanded an altering of the physical landscape. Forests were rapidly cleared, and field boundaries were constructed. Pottery was also being produced, possibly for the first time. The advent of the Neolithic period also provided the megalithic tomb. There are four types of tombs in Ireland, namely the Court Cairn, Portal Tomb, Passage Tomb and Wedge Tomb; the latter of which straddles the Neolithic to Bronze Age transition.

The proposed development area would have remained favourable for settlement into the Neolithic period although there are no recorded Neolithic sites in the vicinity of the proposed development area.

13.3.1.3 Bronze Age (c. 2500–800 BC)

The Bronze Age was marked by the widespread use of metal for the first time in Ireland. As with the transition from Mesolithic to Neolithic, the transition into the early Bronze Age was accompanied by changes in society. The megalithic tomb tradition declined and ended by the middle Bronze Age and the burial of the individual became typical. Cremated or inhumed individuals were often placed in a cist, which is a stone-lined grave, usually built of slabs set upright to form a box-like construction and capped by a large slab or several smaller lintels (Buckley and Sweetman 1991). Barrows and pit burials are also funerary monuments associated with this period.

Another site type thought to reveal of glimpse of domestic life at this time is the burnt mound or *fulacht fia*. A common site within the archaeological record, they are traditionally interpreted as temporary cooking sites, but it has been suggested that they may have had other functions such as brewing, dyeing and bathing. They survive as low mounds of charcoal-enriched soil mixed with an abundance of heat-shattered stones. They are usually horseshoe-shaped and located in low-lying areas near a water source and are often found in clusters. Even when levelled by an activity such as ploughing, they are identifiable as burnt spreads in the landscape (Brindley and Lanting, 1990).

No Bronze Age sites have been recorded within the study area of the proposed development area to date.

13.3.1.4 Iron Age (c. 800 BC–AD 500)

There is increasing evidence for Iron Age settlement and activity in recent years due to development-led excavations as well as projects such as LIARI (Late Iron Age and Roman Ireland) (Cahill Wilson 2014). Yet this period is distinguishable from the rather rich remains of the preceding Bronze Age and subsequent early medieval period, by a relative paucity within the current archaeological record. The Iron Age in Ireland is problematic for archaeologists as few artefacts dating exclusively to this period have been found and without extensive excavation it cannot be determined whether several monument types, such as ring-barrows or standing stones, date to the late Bronze Age or Iron Age. It is likely that there was significant continuity into the Iron Age, with earlier monuments re-used in many cases. There are no known monuments in the vicinity of the proposed development area that would suggest an active presence of Iron Age communities in this area.

13.3.1.5 Early Medieval Period (c. AD 500–1100)

Ireland, as depicted in the surviving sources, was entirely rural in the early medieval period. Ireland at this time was a patchwork of larger and smaller kingdoms known as *túath* and *trícha cét* respectively. Byrne (1973) estimates that there were as many as 150 kings in Ireland at the time, each ruling over a basic territorial unit known as the *túath*. If estimates placing the population of Ireland in the early medieval period at a quarter to half a million people are accurate, then each king would have ruled over between 1,700 and 3,300 subjects within his *túath* (Stout 2017). From the 6th century, many of these subjects would have lived in enclosed settlements known as ringforts.

Secular habitation sites in the early medieval period include *crannógs*, cashels and ringforts, which are largely defined as circular enclosures surrounded by banks and ditches. In addition to these, there is some evidence for unenclosed settlements which are more difficult to identify in the archaeological record. The ringfort or *ráth* is the most common indicator of settlement during the early medieval period. Ringforts are strongly associated with agricultural land and, as such, are rarely situated at higher altitudes. Ringforts and potential ringforts (enclosures) are the most common archaeological sites recorded across the Irish landscape. Enclosures, in many cases, may represent damaged or denuded ringforts.

This period was also characterised by the introduction of Christianity to Ireland. Early churches tended to be constructed of wood or post-and-wattle. Between the late 8th and 10th centuries, mortared stone churches gradually replaced these earlier structures. Many of the sites, some of which were monastic foundations, were probably originally defined by an enclosing wall or bank like that found at the coeval secular sites. This enclosing feature was probably built more to define the sacred character of the area of the church than as a defence against aggression. An inner and outer enclosure can be seen at some of the more important sites; the inner enclosure surrounds the sacred area of the church and burial ground, and the outer enclosure provides a boundary around living quarters and craft areas. Where remains of an enclosure survive, it is often the only evidence that the site was an early Christian foundation. An ecclesiastical enclosure (DU021-005003) is recorded c. 478m south of the proposed development area. The sub-circular raised area contains a graveyard (DU021-005002) and a medieval stone church (DU021-005001). Although the surviving church is of medieval date it may stand on the site of an early medieval ecclesiastical site.

In 2020 a geophysical survey (Russell and Breen 2020, Licence No:. 20R0080) was carried out partially within the proposed development area and in lands to the immediate south. This resulted in the identification of a previously unrecorded circular enclosure with a diameter of c. 30m, likely to represent the remains of an early medieval ringfort. The site was subject to archaeological testing in 2021 (Licence Ref.: 21E0061) and excavation in 2022, although no Excavation Summary has been published for the excavation works.

13.3.1.6 Medieval Period (AD 1100–1600)

This period began with the arrival of the Anglo-Normans in Ireland in support of the deposed King of Leinster, Diarmait MacMurchadha. By the end of the 12th century the Normans had succeeded in conquering much of the country (Stout and Stout 1997). Leinster, including Dublin and Meath, was 'sub-infeudated', meaning that great swathes of land were parcelled out among the Anglo-Norman elites. The Anglo-Norman tenurial system largelyappropriated the older established land units known as *túaths* in the early medieval period but described the territories as manors (MacCotter 2008). The initial stage of the invasion was marked by the construction of motte and bailey castles, which were later replaced with stone castles.

In the later medieval period, a total of seven tower houses were constructed in the wider environs of the proposed development area. These include Grange Castle (DU017-034), from which the wider area takes its name, Kilbride Castle (DU021-004), c. 427m south of the proposed development area and Nangor Castle (DU017-037), c. 1km to the northeast. Kilbride Castle (DU021-004) is no longer extant with its location now occupied by a farm complex. Some of the farm buildings may have been built from the reclaimed fabric of the castle. The castle appears to have survived until 1871-5 when it was depicted on the historic OS mapping. By the time of the 1906-9 OS map, it is annotated as 'site of', indicating it had been demolished.

The existing Kilbride Church (DU021-005001) dates to the medieval period, though stands in ruins today. It was described at the dissolution in 1547 as an old chapel- indicating it was

considered old even in the mid-16th century and described as ruinous as early as 1630 (SMR file). The church was dedicated to St. Bridget, giving the townland its name, Kilbride, deriving from *Cill Bhríde*- Church of Bridget.

The medieval parish church of St. Cuthbert of Lindesfarne was held by St. Mary's Abbey, Dublin from 1186 until 1540 when it was re-united with Clondalkin (Ball 1940). The church (DU017-038001) located c. 1.8km northeast of the proposed development area served the smallest parish in the county. To the south of the church's graveyard (DU017-038001) is a possible moated site (DU017-038003) defined by a flat-topped earthen bank and wide outer fosse.

13.3.1.7 Post-Medieval Period (AD 1600–1900)

The 17th century witnessed the systematic reduction of all of Ireland to English authority, largely through conflicts and the forced settlements, known as 'The Plantations'. With the onset of the 18th century, the political climate settled, and this saw a dramatic rise in the establishment of large residential houses around the country. This was largely because after the turbulence of the preceding centuries, the success of the Protestant cause and the effective removal of any political opposition, the country was at peace. The large country house was only a small part of the overall estate of a large landowner and provided a base to manage often large areas of land that could be dispersed nationally. During the latter part of the 18th century, the establishment of a parkland context (or demesnes) for large houses was the fashion. Although the creation of a parkland landscape involved working with nature, rather than against it, considerable construction effort went into their creation. Major topographical features like rivers and mountains were desirable features for inclusion into, and as a setting, for the large house and parkland.

The closest former parklands to the proposed development area, are the modest demesne associated with Kilcarbury House, c. 490m to the east and the much larger Castle Baggot, c. 575m to the southwest.

The Grand Canal, located c. 1.7km north of the proposed development area, is c. 131km long and links Dublin City to the River Shannon. Work began on the canal in 1756 and it was officially opened to traffic in 1804. While the rise of the railway significantly reduced the popularity of the canal, it was not until 1960 that the last cargo was transported along the Grand Canal.

13.3.2 Summary of Previous Archaeological Fieldwork

A review of the Excavations Bulletin (1970–2022) revealed that several archaeological investigations have taken place within 500m of this site.

Archaeological test trenching of an enclosure and associated features was carried out at Profile Park c. 17m south of the proposed development area (Murphy 2021, Licence No. 21E0061, Figure 13.2). A total of ten test trenches were excavated, targeting anomalies identified during geophysical survey (Russell and Breen 2020, Licence No. 20R0080). Testing confirmed the results of the geophysical survey and succeeded in identifying the remains of the oval/circular enclosure and two further linear features. This enclosure was subsequently excavated in 2022, but no Excavation Summary has been published for these works.

Archaeological testing at a site to the immediate east of the proposed development area revealed one area of archaeological significance consisting of an oval pit (Piera and Lee 2021, Licence No. 21E0692). Several former field boundaries or drainage ditches were also revealed. The identified features (AA1) were later subject to excavation under the same licence (Piera 2022). Archaeological excavation of AA1 indicated that it represented two interconnected pits.

A cobbled surface and some former field boundaries were also identified. Topsoil stripping in this area was later monitored but no features of archaeological significance were identified.

Archaeological test trenching (Murphy 2022, Licence No. 22E0760) following geophysical survey (Murphy 2022, Licence No. 22R0316) was undertaken at Profile Park. Only one potential archaeological feature was identified consisting of a linear feature or ditch of prehistoric/early historic date.

Archaeological monitoring was carried out during the construction of the development to the immediate southeast (O'Flanagan 2012, Licence No. 12E0067). Nothing of archaeological significance was uncovered.

Archaeological testing (Quinn 2015, Licence No. 15E0551) following geophysical survey (Gimson 2015, Licence No. 15R0116) at the substation at Ballybane exposed several modern drainage channels and natural sterile stratigraphy. There was no evidence of any features of archaeological potential. Excavations conducted at the substation in 2017 revealed a series of pits, posts, and stake-holes at Site 1 (O'Flanagan 2017, Licence No. 17E0394). Site 2 consisted of a curvilinear ditch containing animal bone, two pieces of worked flint, and one possible scraper. Area 3 consisted of the remains of a heavily disturbed spread of burnt stone and clay. The material was situated in a hollow and the materials seemed to reflect a dry cooking oven indicative of settlement from at least the Bronze Age.

Archaeological monitoring was also carried out prior to industrial development to the north of the proposed development area, within the 'Kilcarbery Distribution Park' (Licence No. 98E0572, Bennett 1999:170). No features or deposits of archaeological potential were identified during these works. Post-medieval and modern pottery was recovered from the topsoil.

Archaeological testing (O'Dowd 2018, Licence No. 18E0292) following geophysical survey (Leigh 2015, Licence No. 15R0147) at Ballybane and Aungierstown only revealed drainage and cultivation features relating to the post-medieval agricultural usage of the lands.

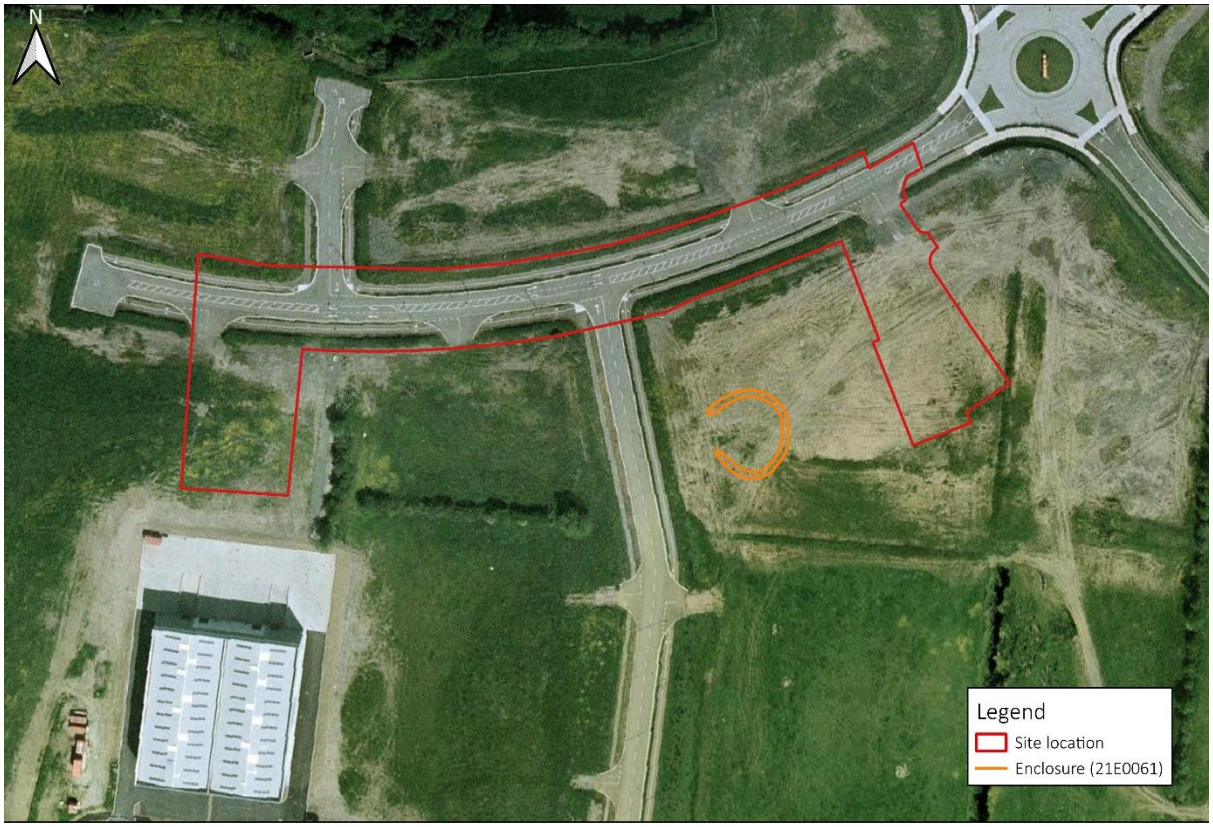

Figure 133-2: Location of previously unrecorded enclosure excavated in 2022 to the south of the proposed development area

13.3.3 Cartographic Analysis

13.3.3.1 Down Survey Maps of the Barony of Newcastle, c. 1655

There is little detail provided for the site of the proposed development area in these early maps. The site is located within an area noted as 'unforfeited lands' and it is therefore not shown in any detail as the primary purpose of these early maps was to detail land to be forfeited. It is likely the proposed development area was in use as agricultural land at this time.

13.3.3.2 John Rocque, Map of County Dublin, 1760 (Figure 13-3)

By the time of this mapping in 1760, the site of the proposed development is depicted as open agricultural land. Kilbride church (DU021-005001), annotated as in ruins, is shown to the south. A structure is shown in the approximate location of Kilbride castle (DU021-004) but is unlabelled. In the wider landscape, Grange Castle (DU017-034) and Nangor (DU017-037) are also shown.

13.3.3.3 John Taylor, Map of Dublin City and its Environs, 1816 (Figure 13-3)

The site of the proposed development is depicted in an undeveloped location on this map, within an area labelled 'lands of Kilbride'. Kilbride church (DU021-005001) is again shown and labelled as in ruins. A small structure is depicted to the west of the site's approximate location and labelled 'Kilcarbery'.

13.3.3.4 First Edition Ordnance Survey Map, 1843, scale 1:10,056 (Figure 13-4)

This is the first accurate historic mapping coverage of the area containing the proposed development. The site of the proposed development forms part of an agricultural landscape, comprising parts of two fields. The site also passes through the townland boundary between Kilbride and Aungierstown and Ballybane, which also defines the parish boundary between Kilbride and Kilmactalway. A laneway is located to the east leading to Kilbride Castle (DU021-004) to the south. Kilbride Church (DU021-005001) is also shown within a sub-circular graveyard.

13.3.3.5 Ordnance Survey Map, 1871-5, scale 1:10,056 (Figure 13-4)

There is no change to the site of the proposed development by the time of this map. To the south, Kilbride House has been constructed immediately to the west of Kilbride Castle (DU021-004).

13.3.3.6 Ordnance Survey Map, 1906–9, scale 1:2500

There is no significant change to the proposed development area shown on this map. Kilbride Castle (DU021-004) is now annotated as 'site of' indicating that the castle is no longer extant by this time. While Kilbride Church (DU021-005001) is marked as 'in ruins' for the first time.

13.3.3.7 Ordnance Survey Map, 1935-8, scale 1:10,056

There are no significant changes to the proposed development area on this map.

Figure 133-3: Extracts from historic maps (1760 and 1816) showing the approximate location of the proposed development area

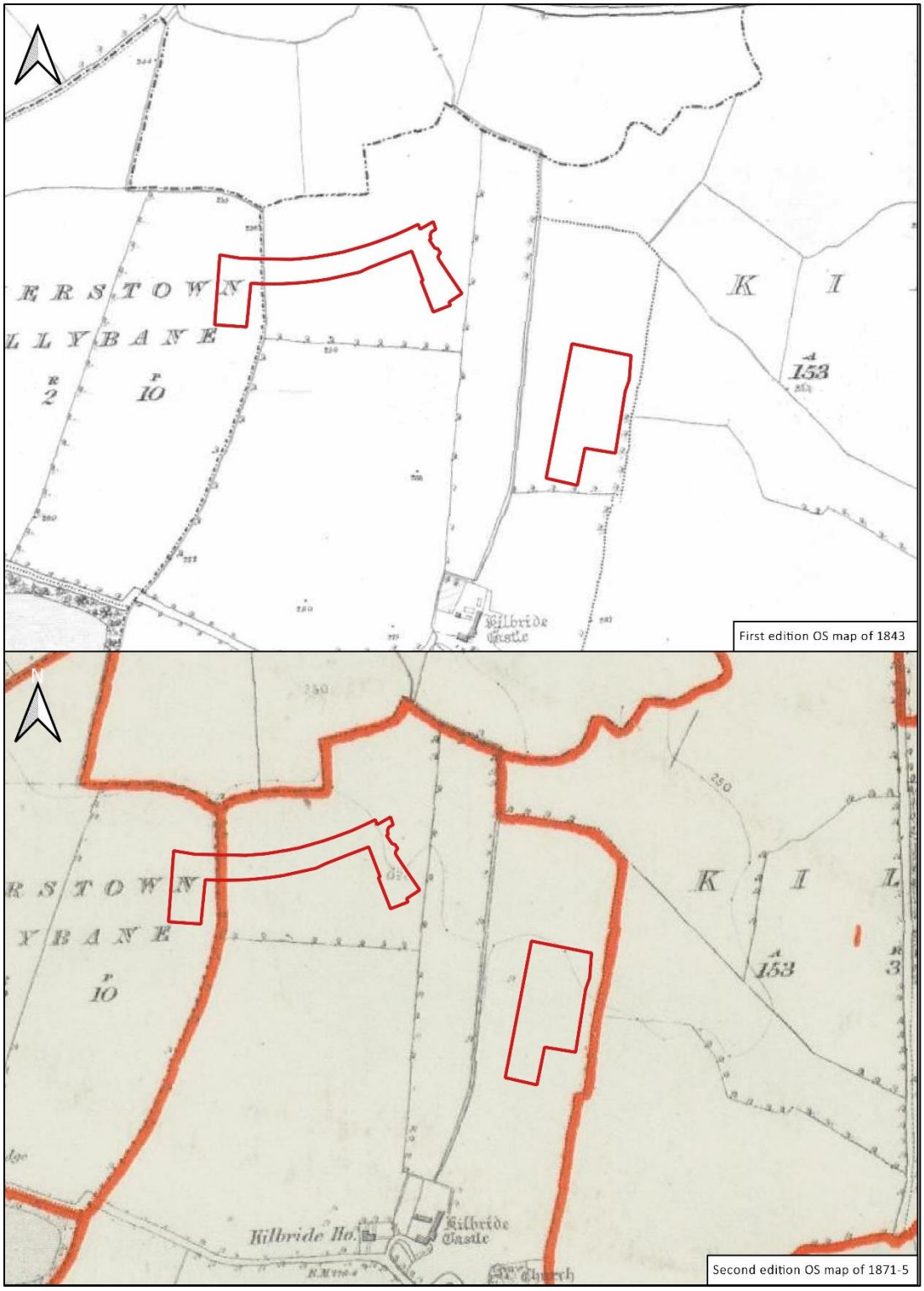

Figure 133-4: Extracts from historic OS maps (1843 and 1871-5) showing the proposed development area

13.3.4 County Development Plan

The South County Dublin Development Plan (2022-2028) recognises the statutory protection afforded to all RMP sites under the National Monuments Legislation (1930–2014). The development plans list aims and objectives in relation to archaeological heritage (Appendix 13-1). It is a policy of the South County Dublin Development Plan (2022-2028) to promote the in-

situ preservation of archaeology as the preferred option where development would have an impact on buried artefacts. Where preservation in situ is not feasible, sites of archaeological interest shall be subject to archaeological investigations and recording according to best practice, in advance of redevelopment.

There are no recorded archaeological sites within the proposed development area. There are four recorded monuments within the 500m study area of the proposed development. These comprise a castle (DU0021-004) and a church, graveyard and ecclesiastical enclosure group (DU0021-005001-3) (Appendix 13-1; Table 13.1).

Table 133-1: Recorded Archaeological Sites

RMP No.	Location	Classification	Distance From Site
DU021-004	Kilbride	Castle - unclassified	c. 427m south
DU021-005001-003	Kilbride	Church, Graveyard and Ecclesiastical enclosure	c. 478m south

13.3.5 Stray Finds within the Surrounding Area

Information on artefact finds from the study area in County Dublin has been recorded by the National Museum of Ireland since the late 18th century. Location information relating to these finds is important in establishing prehistoric and historic activity in the study area.

A review of the topographical files revealed that no stray finds have been recorded from within the study area of the proposed development to date.

13.3.6 Aerial Photographic Analysis

Inspection of the aerial photographic coverage of the proposed development area held by the Ordnance Survey (1995–2013), Google Earth (2008–2022) and Bing Maps (2022) revealed the proposed development area has been subject to disturbance in recent years during the construction of the roadway (Profile Park), which defines the majority of the site's footprint (Google Earth, March 2009, Figure 13-5). Coverage from 2022 (Google Earth, March 2022) shows the position of archaeological trenches from previous investigations (Piera 2021, Licence No. 21E0692) and an enclosure. No previously unknown archaeological sites were noted during the analysis.

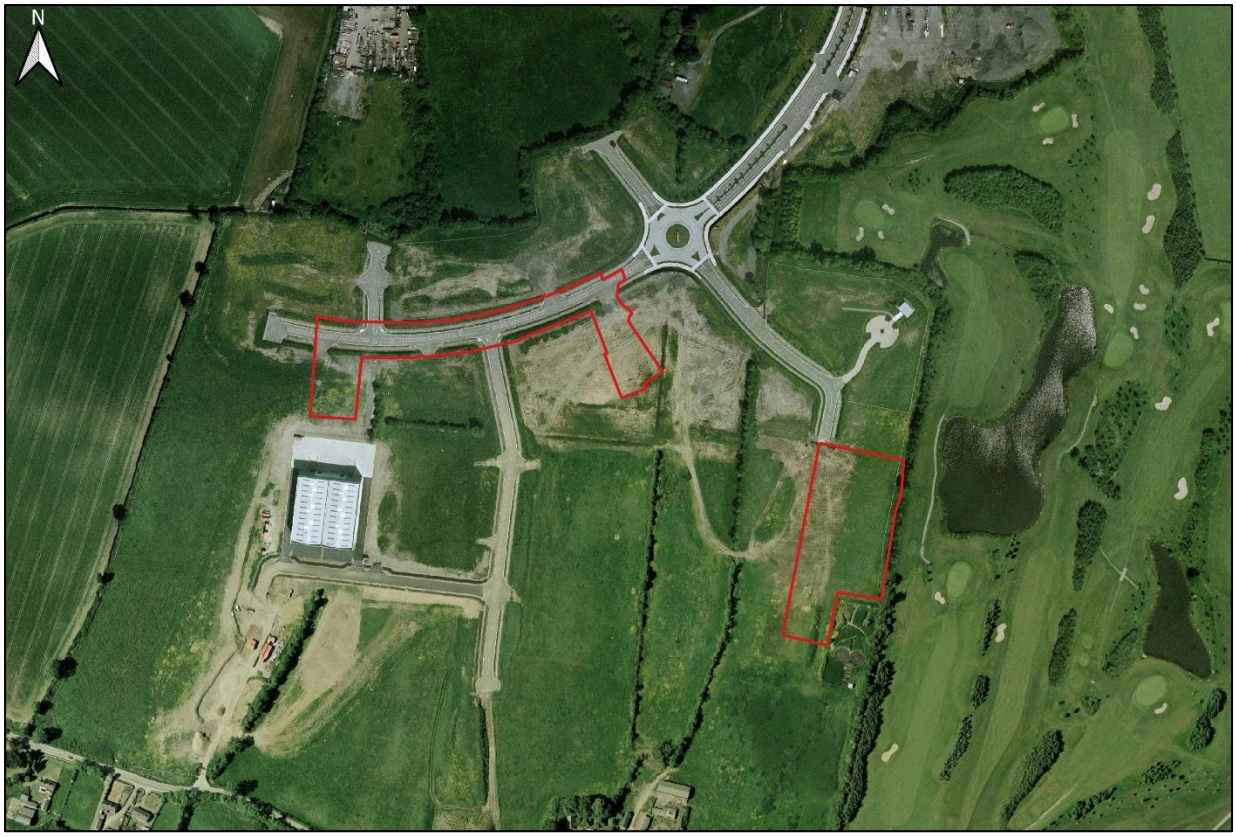

Figure 133-5: Satellite imagery of the proposed development area (Google Earth 2009)

13.3.7 Field Inspection

The field inspection sought to assess the site, its previous and current land use, the topography, and any additional information relevant to the report. During the field investigation the proposed development site and its immediate surrounding environs were inspected.

The proposed development area to the east comprises an area of flat disturbed ground (between existing plant and road) (Plate 13.1). The southern extent of the compound area is artificially raised due to importation of material (Plate 13.2). This is also the case for the northern extent of the site, which is bound by Profile Park Road. The western and central extents of the site is defined by Profile Park Road itself until it reaches a large industrial complex to the south (Plate 13.3).

No previously unrecorded features or areas of archaeological significance were identified during the site inspection. The inspection confirmed that both areas have been disturbed in recent years, as indicated in the aerial photographic coverage.

Plate 133-1: Proposed development area, facing southwest

Plate 133-2: Proposed compound area, facing south-southeast

Plate 133-3: Central section of proposed development, facing east

13.3.8 Cultural Heritage

The term 'cultural heritage' can be used as an over-arching term that can be applied to both archaeology and architectural; however, it also refers to more ephemeral aspects of the environment, which are often recorded in folk law or tradition or possibly date to a more recent period. There are no specific sites of cultural heritage significance within the study area of the proposed development; however, the archaeological sites discussed above should also be considered cultural heritage and the townlands and placename analysis detailed below are also of cultural heritage significance.

13.3.8.1 Townlands

The townland is an Irish land unit of considerable longevity as many of the units are likely to represent much earlier land divisions. However, the term townland was not used to denote a unit of land until the Civil Survey of 1654. It bears no relation to the modern word 'town' but like the Irish word *baile* refers to a place. It is possible that the word is derived from the Old English *tun land* and meant 'the land forming an estate or manor' (Culleton 1999, 174).

Gaelic land ownership required a clear definition of the territories held by each sept and a need for strong, permanent fences around their territories. It is possible that boundaries following ridge tops, streams or bog are more likely to be older in date than those composed of straight lines (*ibid.* 179).

Many townlands are referred to in the 17th century, when land documentation records begin. Many of the townlands are mapped within the Down Survey of the 1650s, so called as all measurements were carefully 'laid downe' on paper at a scale of forty perches to one inch. Therefore, most are in the context of pre-17th century landscape organisation (McErlean 1983, 315).

In the 19th century, some demesnes, deer parks or large farms were given townland status during the Ordnance Survey and some imprecise townland boundaries in areas such as bogs or lakes, were given more precise definition (*ibid.*). Larger tracks of land were sub-divided and named Upper, Middle or Lower, as well as Beg and More (small and large) and north, east, south, and west (Culleton 1999, 179). By the time the first Ordnance Survey had been completed a total of 62,000 townlands were recorded in Ireland.

The proposed development area is located within the townlands of Kilbride and Aungierstown and Ballybane. The townland boundary between these townlands traverses the proposed development area but has been removed in the past to facilitate the modern roadway. The surrounding townlands consist of Baldonnell Lower, Baldonnell Upper, Ballybane, Kilcarbery and Kilmactalway.

13.3.8.2 Toponomy of Placenames

Townland and topographic names are an invaluable source of information on topography, land ownership and land use within the landscape. They also provide information on history; archaeological monuments and folklore of an area. A place name may refer to a long-forgotten site and may indicate the possibility that the remains of certain sites may still survive below the ground surface. The Ordnance Survey surveyors wrote down townland names in the 1830's and 1840's, when the entire country was mapped for the first time. Some of the townland names in the study area are of Irish origin and through time have been anglicised. The main references used for the place name analysis are *Irish Local Names Explained* by P.W Joyce (1870) and www.logainm.ie. A description and possible explanation of each townland name in the environs of the proposed route are provided in the below table.

Table 133-2: Place Name Analysis

Name	Derivation	Possible Meaning
Aungierstown and Ballybane	-	Aungier's Town/The white homestead
Kilbride	*Cill Bhríde*	St. Bridget's Church
Kilmactalway	*Cill Mhic Thalmhaigh*	Mac Shalwy's Church
Ballybane	*An Baile Bán*	The white homestead
Baldonnell	*Baile Dhónaill*	Donal's homestead
Kilcarbery	*Cill/coill Chairbre*	Church/wood of Cairbre

13.4 CONCLUSIONS

The proposed development area is in the townlands of Kilbride and Aungierstown and Ballybane, Parish of Kilbride in the Barony of Newcastle, County Dublin. There are four individual recorded monuments within 500m of the proposed development area. These comprise a castle (DU0021-004) and a church, graveyard and ecclesiastical enclosure group (DU0021-005001-3), located c. 427m and c. 478m to the south respectively.

Archaeological test trenching at Profile Park confirmed the results of a geophysical survey and succeeded in identifying the remains of an enclosure and two further linear features. This site was previously unrecorded and has been excavated during 2022. Further testing revealed a linear feature or ditch of prehistoric/early historic date. Archaeological testing (Piera and Lee 2021, Licence No. 21E0692) to the immediate east of the proposed development area revealed one area of archaeological significance consisting of an oval pit. Subsequent archaeological

excavation of AA1 indicated that it represented two interconnected pits (Piera 2022). A cobbled surface and some former field boundaries were also identified.

Archaeological testing at Ballybane substation discovered a series of pits, posts, and stake-holes at Site 1. Site 2 consisted of a curvilinear ditch containing animal bone, two pieces of worked flint, and one possible scraper. Area 3 consisted of the remains of a heavily disturbed spread of burnt stone and clay. The material was situated in a hollow and the materials seemed to reflect a dry cooking oven indicative of settlement from at least the Bronze Age (O'Flanagan 2017).

A review of the historic mapping demonstrated that the proposed development area remained undeveloped agricultural greenfield throughout the post-medieval period. Analysis of aerial photographic and satellite imagery proved the site remained greenfield until the construction of the roadway (Profile Park). The aerial photographic coverage has shown that the site of the proposed development area has been subject to disturbance in the recent past. Coverage from 2022 shows the position of archaeological trenches from previous investigations adjacent, and the previously unrecorded enclosure in proximity to the proposed development area.

A review of the topographical files revealed that no stray finds have been recovered from within the study area of the proposed development area to date.

A field inspection confirmed that the proposed development area has been subject to disturbance, as indicated in the aerial photographic coverage. No previously unknown features of archaeological potential were identified during the field inspection.

13.5 ASSESSMENT OF SIGNIFICANT EFFECTS

13.5.1 Do Nothing Scenario

If the proposed development were not to proceed, there would be no negative impact on the archaeological or cultural heritage resource of the site or its surrounding area.

13.5.2 Construction Phase

13.5.2.1 Archaeology

There is no potential impact on the archaeological and cultural heritage resource within the extent of the proposed development which is located within an existing area that has been stripped of topsoil (archaeologically monitored) and the existing roadway. Whilst the remainder of the proposed development area (compound area) has been subject to disturbance, it is unclear how this disturbance may have affected the potential archaeological resource. It remains possible that ground disturbances associated with the development may have a direct negative impact on archaeological remains that may survive within the site. Impacts have the potential to range from moderate to significant in scale, prior to the application of mitigation.

13.5.2.2 Cultural Heritage

No potential negative impacts upon the cultural heritage resource are predicted because of the construction of the proposed development.

13.5.3 Operational Phase

No negative impacts during operation are predicted upon the archaeological and cultural heritage resource.

13.5.3.1 Potential Cumulative Impacts

The proposed and permitted surrounding developments have been reviewed and no cumulative impacts upon the archaeological or cultural heritage resource have been identified.

13.6 MITIGATION AND MONITORING MEASURES

13.6.1 Construction Phase

13.6.1.1 Archaeology

All topsoil/overburden removal within the compound area will be monitored by a suitably qualified archaeologist. If any features of archaeological potential are discovered during the works further archaeological mitigation may be required, such as preservation in-situ or by record. Any further mitigation will require approval from the National Monuments Service of the Department of Housing, Local Government and Heritage (DoHLGH).

No archaeological mitigation is required for the section of development located in the profile park development and the existing roadway to the north.

The mitigation measure identified above would also function as a monitoring system during construction to allow the further assessment of the scale of the predicted impacts and the effectiveness of the recommended mitigation measures.

13.6.1.2 Cultural Heritage

As there are no potential impacts on the cultural heritage resource, no mitigation is deemed necessary.

13.6.2 Operational phase

No mitigation relating to the operational phase and the archaeological and cultural heritage resource is required.

13.7 CUMULATIVE EFFECTS

No cumulative impacts have been identified that will affect the archaeological or cultural heritage resource.

13.8 RESIDUAL EFFECTS

Following the completion of mitigation measures, there will be no significant residual impacts upon the archaeological and cultural heritage resource.

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14.0 LANDSCAPE/TOWNSCAPE & VISUAL IMPACT ASSESSMENT

14.1 INTRODUCTION

This Landscape / Townscape and Visual impact Assessment report has been prepared in respect of a 110kV electrical substation at a site located in Profile Park, Dublin 22. Greener Ideas Limited is proposing to develop a 110kV AIS substation on lands adjacent to the permitted 102 MW dual fuel gas fired power plant (pl. ref. SD21A/0167) at a site located in the fully enclosed and secured, private Profile Park business park. This report describes the townscape/visual context of the proposed development and assesses the likely impacts of the scheme on the receiving environment, in terms of both townscape character and visual amenity.

Landscape/Townscape Impact Assessment (LIA) relates to assessing effects of a development on the Landscape/Townscape as a resource in its own right and is concerned with how the proposal will affect the elements that make up the Landscape/Townscape, the aesthetic and perceptual aspects of the Landscape/Townscape and its distinctive character.

Visual Impact Assessment (VIA) relates to assessing effects of a development on specific views and on the general visual amenity experienced by people. This deals with how the surroundings of individuals or groups of people may be specifically affected by changes in the content and character of views as a result of the change or loss of existing elements of the Landscape/Townscape and/or introduction of new elements. Visual impacts may occur from; Visual Obstruction (blocking of a view, be it full, partial or intermittent) or; Visual Intrusion (interruption of a view without blocking).

This LVIA uses methodology as prescribed in the following guidance documents:

- Environmental Protection Agency (EPA) publication 'Guidelines on the Information to be contained in Environmental Impact Statements (2022) and the accompanying Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (Draft 2015);
- Landscape/Townscape Institute and the Institute of Environmental Management and Assessment publication entitled Guidelines for Landscape/Townscape and Visual Impact Assessment (2013); and
- South Dublin County Council County Development Plan 2022-2028.

14.1.1 Statement of Authority

This Landscape/Townscape and Visual Assessment report was prepared by Macro Works Ltd of Cherrywood Business Park, Loughlinstown, Dublin 18; a consultancy firm specialising in Landscape and Visual Assessment and associated maps and graphics. Relevant experience includes a vast range of infrastructural, industrial and commercial projects since 1999, including numerous residential mixed-used development projects.

14.2 METHODOLOGY

Production of this Landscape/townscape and Visual Impact Assessment involved:

- A desktop study to establish an appropriate study area, relevant Landscape/Townscape and visual designations in the South Dublin County Development Plan as well as other sensitive visual receptors. This stage culminates in the selection of a set of potential viewpoints from which to study the effects of the proposal;

- Fieldwork to establish the Landscape/Townscape character of the receiving environment and to confirm and refine the set of viewpoints to be used for the visual assessment stage;
- Assessment of the significance of the Landscape/Townscape impact of the development as a function of Landscape/Townscape sensitivity weighed against the magnitude of the Landscape/Townscape impact; and
- Assessment of the significance of the visual impact of the development as a function of visual receptor sensitivity weighed against the magnitude of the visual impact. This aspect of the assessment is supported by photomontages prepared in respect of the selected viewpoints.

This document uses methodology as prescribed in the Institute of Environmental Management and Assessment (IEMA) and Landscape Institute (UK) 'Guidelines for Landscape and Visual Impact Assessment' (GLVIA-2013).

Although this is principally a 'townscape' assessment, it utilises the same outline methodology as would be employed for the more familiar Landscape and Visual Impact Assessment (LVIA) of developments in rural settings. The justification for this approach is provided below.

It is important to note that the Guidelines for Landscape and Visual Impact Assessment' (GLVIA-2013) follow the European Landscape Convention (ELC) definition of landscape: *'Landscape is an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors'*(Council of Europe, 2000). Thus, GLVIA-2013 covers all landscapes from *"high mountains and wild countryside to urban and fringe farmland (rural landscapes), marine and coastal landscapes (seascapes) and the landscapes of villages towns and cities (townscapes)"* - whether protected or degraded.

In the case of this project, the study area is peri-urban in nature, but with a marginally more dominant urban setting or 'townscape.' This is defined in GLVIA-2013 (Section 2.7) as:

" 'Townscape' refers to areas where the built environment is dominant. Villages, towns and cities often make important contributions as elements in wider-open landscapes but townscape means the landscape within the built-up area, including the buildings, the relationships between them, the different types of urban spaces, including green spaces, and the relationship between buildings and open spaces. There are important relationships with historic dimensions of landscape and townscape, since evidence of the way the villages, towns and cities change and develop over time contributes to their current form and character."

14.2.1 LANDSCAPE / TOWNSCAPE IMPACT ASSESSMENT CRITERIA

When assessing the potential impacts on the townscape resulting from a proposed development, the following criteria are considered:

- Landscape/townscape character, value and sensitivity;
- Magnitude of likely impacts;
- Significance of landscape effects.

The sensitivity of the townscape to change is the degree to which a particular setting can accommodate changes or new elements without unacceptable detrimental effects to its essential characteristics. Landscape/townscape Value and Sensitivity is classified using the following criteria set out in Table 14.1.

Table 14-1: Landscape/Townscape Value and Sensitivity

Sensitivity	Description
Very High	Areas where the townscape character exhibits a very low capacity for change in the form of development. Examples of which are high value townscapes, protected at an international or national level (e.g. World Heritage Site), where the principal management objectives are likely to be protection of the existing character.
High	Areas where the townscape character exhibits a low capacity for change in the form of development. Examples of which are high value townscapes, protected at a national or regional level, where the principal management objectives are likely to be considered conservation of the existing character.
Medium	Areas where the townscape character exhibits some capacity and scope for development. Examples of which are townscapes, which have a designation of protection at a county level or at non-designated local level where there is evidence of local value and use.
Low	Areas where the townscape character exhibits a higher capacity for change from development. Typically, this would include lower value, non-designated townscapes that may also have some elements or features of recognisable quality, where management objectives include, enhancement, repair and restoration.
Negligible	Areas of townscape character that include derelict sites and degradation where there would be a reasonable capacity to embrace change or the capacity to include the development proposals. Management objectives in such areas could be focused on change, creation of townscape improvements and/or restoration.

The magnitude of a predicted landscape/townscape impact is a product of the scale, extent or degree of change that is likely to be experienced as a result of the permitted power plant. The magnitude takes into account whether there is a direct physical impact resulting from the loss of landscape/townscape components and/or a change that extends beyond the immediate setting that may have an effect on the townscape character. Table 14-2 refers.

Table 14-2: Magnitude of Landscape/Townscape Impacts

Sensitivity	Description
Very High	Change that would be large in extent and scale with the loss of critically important landscape elements and features, that may also involve the introduction of new uncharacteristic elements or features that contribute to an overall change of the townscape in terms of character, value and quality.
High	Change that would be more limited in extent and scale with the loss of important townscape elements and features, that may also involve the introduction of new uncharacteristic elements or features that contribute to an overall change of the townscape in terms of character, value and quality.
Medium	Changes that are modest in extent and scale involving the loss of landscape characteristics or elements that may also involve the introduction of new uncharacteristic elements or features that would lead to changes in landscape character, and quality.
Low	Changes affecting small areas of landscape character and quality, together with the loss of some less characteristic landscape elements or the addition of new features or elements.
Negligible	Changes affecting small or very restricted areas of landscape character. This may include the limited loss of some elements or the addition of some new features or elements that are characteristic of the existing landscape or are hardly perceivable.
Positive	Changes that restore a degraded landscape or reinforce characteristic landscape elements.

The significance of a landscape/townscape impact is based on a balance between the sensitivity of the landscape receptor and the magnitude of the impact. The significance of landscape impacts is arrived at using the following graph set out in Table 14.3.

Table 14-3: Impact Significance Graph

	Sensitivity of Receptor				
Scale/Magnitude	*Very High*	*High*	*Medium*	*Low*	*Negligible*
Very High	Profound	Profound-substantial	Substantial	Moderate	Minor
High	Profound-substantial	Substantial	Substantial-moderate	Moderate - slight	Slight-imperceptible
Medium	Substantial	Substantial-moderate	Moderate	Slight	Imperceptible
Low	Moderate	Moderate - slight	Slight	Slight-imperceptible	Imperceptible
Negligible	Slight	Slight-imperceptible	Imperceptible	Imperceptible	Imperceptible

Note: The significance matrix provides an indicative framework from which the significance of impact is derived. The significance judgement is ultimately determined by the assessor using professional judgement. Due to nuances within the constituent sensitivity and magnitude judgements, this may be up to one category higher or lower than indicated by the matrix. Judgements indicated in orange/mustard are considered to be 'significant impacts' in EIA terms.

14.2.2 Visual Impact Assessment Criteria

As with the landscape/townscape impact, the visual impact of the proposed development will be assessed as a function of sensitivity versus magnitude. In this instance the sensitivity of the visual receptor, weighed against the magnitude of the visual effect.

Sensitivity of Visual Receptors

Unlike landscape sensitivity, the sensitivity of visual receptors has an anthropocentric (human) basis. It considers factors such as the perceived quality and values associated with the view, the landscape/townscape context of the viewer, the likely activity they are engaged in and whether this heightens their awareness of the surrounding landscape. A list of the factors considered by the assessor in estimating the level of sensitivity for a particular visual receptor is outlined below to establish visual receptor sensitivity at each VRP:

Susceptibility of Receptors

In accordance with the Institute of Environmental Management and Assessment ("IEMA") Guidelines for Landscape and Visual Assessment (3rd edition 2013) visual receptors most susceptible to changes in views and visual amenity are:

- "Residents at home;

- People, whether residents or visitors, who are engaged in outdoor recreation, including use of public rights of way, whose attention or interest is likely to be focused on the landscape and on particular views;
- Visitors to heritage assets, or to other attractions, where views of the surroundings are an important contributor to the experience;
- Communities where views contribute to the landscape setting enjoyed by residents in the area;
- Travelers on road rail or other transport routes where such travel involves recognised scenic routes and awareness of views is likely to be heightened".
-
- Visual receptors that are less susceptible to changes in views and visual amenity include;
- "People engaged in outdoor sport or recreation, which does not involve or depend upon appreciation of views of the landscape;
- People at their place of work whose attention may be focused on their work or activity, not their surroundings and where the setting is not important to the quality of working life".

Recognised scenic value of the view (County Development Plan designations, guidebooks, touring maps, postcards etc.). These represent a consensus in terms of which scenic views and routes within an area are strongly valued by the population because in the case of County Developments Plans, for example, a public consultation process is required;

Views from within highly sensitive townscape areas. These are likely to be in the form of Architectural Conservation Areas, which are incorporated within the Development Plan and therefore subject to the public consultation process. Viewers within such areas are likely to be highly attuned to the townscape around them;

Primary views from residential receptors. Even within a dynamic city context views from residential properties are an important consideration in respect of residential amenity;

Intensity of use, popularity. This relates to the number of viewers likely to experience a view on a regular basis and whether this is significant at a national or regional scale;

Viewer connection with the townscape. This considers whether or not receptors are likely to be highly attuned to views of the townscape i.e., commuters hurriedly driving on busy roads versus tourists focused on the character and detail of the townscape;

Provision of vast, elevated panoramic views. This relates to the extent of the view on offer and the tendency for receptors to become more attuned to the surrounding landscape at locations that afford broad vistas;

Sense of remoteness and/or tranquility. Receptors taking in a remote and tranquil scene, which is likely to be fairly static, are likely to be more receptive to changes in the view than those taking in the view of a busy street scene, for example;

Degree of perceived naturalness. Where a view is valued for the sense of naturalness of the surrounding landscape it is likely to be highly sensitive to visual intrusion by distinctly manmade features;

Presence of striking or noteworthy features. A view might be strongly valued because it contains a distinctive and memorable landscape / townscape feature such as a cathedral or castle;

Historical, cultural and / or spiritual significance. Such attributes may be evident or sensed by receptors at certain viewing locations, which may attract visitors for the purposes of contemplation or reflection heightening the sense of their surroundings;

Rarity or uniqueness of the view. This might include the noteworthy representativeness of a certain townscape type and considers whether the receptor could take in similar views anywhere in the broader region or the country;

Integrity of the townscape character. This looks at the condition and intactness of the townscape in view and whether the townscape pattern is a regular one of few strongly related components or an irregular one containing a variety of disparate components;

Sense of place. This considers whether there is special sense of wholeness and harmony at the viewing location;

Sense of awe. This considers whether the view inspires an overwhelming sense of scale or the power of nature.

Those locations which are deemed to satisfy many of the above criteria are likely to be of higher sensitivity. No relative importance is inferred by the order of listing in Table 14.5. Overall sensitivity may be a result of a number of these factors or, alternatively, a strong association with one or two in particular.

14.2.3 IMPACT MAGNITUDE

The visual impact magnitude relates to the scale and nature of the visual change brought about by the proposal and this is reflected in the criteria contained in Table 14.4 below.

Table 14-4: Magnitude of Visual Impacts

Criteria	Description
Very High	The proposal alters a large proportion or critical part of the available vista and is without question the most distinctive element. A high degree of visual clutter or disharmony is also generated, strongly reducing the visual amenity of the scene.
High	The proposal alters a significant proportion or important part of the available vista and is one of the most noticeable elements. A considerable degree of visual clutter or disharmony is also likely to be generated, appreciably reducing the visual amenity of the scene.

Medium	The proposal represents a moderate alteration to the available vista, is a readily noticeable element and/or it may generate a degree of visual clutter or disharmony, thereby reducing the visual amenity of the scene.
Low	The proposal alters the available vista to a minor extent and may not be noticed by a casual observer and/or the proposal would not have a marked effect on the visual amenity of the scene.
Negligible	The proposal would be barely discernible within the available vista and/or it would not detract from, and may even enhance, the visual amenity of the scene.
Positive	Changes that enhance the available vista by reducing visual clutter or restoring degraded features.

14.2.4 VISUAL IMPACT SIGNIFICANCE

As stated above, the significance of visual impacts is a function of visual receptor sensitivity and visual impact magnitude. This relationship is expressed in the same significance matrix and applies the same EPA definitions of significance as used earlier in respect of townscape impacts (Table 14.4 refers).

14.2.5 QUALITY OF EFFECTS

In addition to assessing the significance of landscape/townscape effects and visual effects, EPA Guidance for EIAs requires that the quality of the effects is also determined. This could be negative/adverse, neutral, or positive/beneficial.

Whereas, the introduction of new built elements into countryside areas more often results in negative landscape and visual effects, in urban and peri-urban settings, development proposals are often replacing one built feature with another or developing 'brownfield' sites with specific zoning objectives. The consequence for the townscape character and visual amenity is often beneficial, or may be a combination of positive effects and negative effects for different receptors. In the context of this assessment, the judgment of the quality of the effects is made in combination with the significance judgement for both landscape/townscape impacts and visual impacts e.g., Moderate / Positive or Moderate / Negative. A description of the quality of Landscape/Townscape effects is outlined below:

- Positive: A positive effect would add to the Landscape/Townscape quality and character of the site and its wider surrounds.
- Neutral: A neutral effect would have a low or negligible impact on the Landscape/Townscape quality and considered part of normal Landscape/Townscape quality.
- Negative: A negative effect would involve the loss of Landscape/Townscape elements resulting in a reduction to the existing Landscape/Townscape quality.

Landscape/Townscape and Visual effects are also categorised in this report according to their duration, in line with EPA Guidance for EIAs:

- Temporary – Lasting for one year or less;

- Short Term – Lasting one to seven years;
- Medium Term – Lasting seven to fifteen years;
- Long Term – Lasting fifteen years to sixty years; and
- Permanent – Lasting over sixty years.

14.2.6 EXTENT OF STUDY AREA

It is anticipated that the proposed development is not likely to give rise to significant landscape/townscape or visual impacts beyond approximately 1km. However, out of an abundance of caution, a 2km-radius study area is used in this instance, with a focus on those receptors within 1km of the site (see Figure 14-1 below).

Figure 14-1: Study Area

14.3 EXISTING ENVIRONMENT

The landscape/townscape baseline represents the existing context and is the scenario against which any changes to it, brought about by the proposed substation, will be assessed. A description of the landscape/townscape context of the proposed site and wider study area is provided below. Although this description forms part of the landscape/townscape baseline, many of the elements identified

also relate to visual receptors i.e., places from which viewers can potentially see the proposed substation. The visual resource will be described in greater detail in Section 14.8.

14.3.1 Landscape/Townscape Context

The terrain of the study area is generally flat with elevation declining very slightly toward the north, and very gradually inclining toward the south of the study area, near Casement Aerodrome. However, most of the study area is located between 65 and 85m AOD, with the site itself sitting at 74m AOD. Within the 2km radius study area, there is considerable diversity of land use, although one with a noticeable peri-urban industrial-commercial imprint. This is consistent with Profile Park's setting, where existing tenants and tenants of the surrounding business and enterprise parks include Google, Microsoft, Digital Realty Trust and Telecity. There is an existing network of electrical infrastructure to the immediate west of the proposed site, the closest of which is Barnakyle 110kV substation, located approximately 260m west of the proposed site, within Profile Park. Furthermore, the Castlebaggot 110/220kV substation, and two private substations - Cyrus One 110kV substation and a smaller 38kV substation, are located in Grange Castle Business Park South, adjacent to Profile Park. This network of electrical infrastructure serves the surrounding business parks and data centres and provide electrical transmission connectivity to the national electricity transmission grid system. The broader exception to this industrial-commercial imprint in the study area is Grange Castle Golf Club, located approximately 250m east of the proposed site, and Corkagh Park (i.e. a large, popular, public park), in the east of the study area; agricultural lands in the west of the study area and the Grand Canal corridor in the far north of the study area (i.e. more than 1.6km north of the site). The Irish military airbase that is Casement/Baldonnel Aerodrome is located within 500m south of the site. Directly north of Profile Park is the built-up Kilbarry Industrial Park (Figure 14-4 refers), while in the northeast quadrant there is a spread of low-density housing estates. As previously mentioned, to the immediate west of Profile Park is Grange Castle South Business Park (see Figure 14-5) with no 'through road' yet established between the two business parks. The development pattern within the study area is sporadic with little in the way of established building lines and frequent vacant and disused areas, interspersed with intensely utilised patches of landscape.

Several regional road routes pass through the study area, namely the R134, R136 and R120. These road routes act as arteries, connecting the built up industrial and residential areas within the study area, to national routes in the wider vicinity. The R136 passes through the east of the study area, in a north/south direction, connecting the N4 to the N7. The R134 aligns the northern border of Profile Park heading in an east/west direction, separating Grange Castle Business Park into distinct north and south portions. The R134 connects to the R120 as it passes through the western portion of the study area, linking Lucan to Newcastle. There is also a network of smaller local roads within the study area which serve to interconnect the larger transport routes.

Figure 14-2: Site context within Profile Park

While the study area was predominantly rural up until 15-20 years ago, it is now typical of peri-urban contexts across much of west/southwest Dublin; a highly developed realm with very limited aesthetic or naturalistic qualities. As a result of its peri-urban setting, the land use of the study area is highly modified and utilitarian, typically comprising of anthropogenic land uses entailing extensive residential developments, as well as industrial and commercial developments, major route corridors and overhead electrical cable infrastructure. This is also reflective of the site and its immediate vicinity, which is located to the eastern periphery of a 100 acre (40.5 Ha) fully enclosed, partially-developed private business park (i.e. Profile Park). As is consistent with its business park setting, there is a negligible degree of naturalistic, ecological or scenic value associated with the site and its surrounds. The proposed substation development will be located on greenfield lands to the immediate northwest of an existing, fully constructed, Digital Realty data centre, and to the immediate west of the permitted Gas Fired Peaking Power Plant (pl. ref. SD21A/0167).

In this instance, it should be noted that the lands to the immediate east of the site will soon be occupied by the aforementioned Gas Fired Peaking Power Plant. It should also be noted that, as its intended use is to receive electricity generated by the permitted power plant, it is unlikely that the proposed substation will be constructed in isolation to the permitted power plant. Therefore, the permitted power plant has been considered as the imminent baseline context (Figure 14-3 refers). The main facade of the building is that of a series of broad horizontal bands of alternating dark and

light tone blocks divided by narrow horizontal bangs of aluminium cladding. These narrow bands of aluminium cladding are used along the entire western end of the main building, as can be seen in Figure 14-3. The use of this high quality semi-reflective finish breaks up the perceived massing and length of the main building by using an alternate treatment to the eastern and central façade and; it provides the opportunity for reflectance of the sky and proposed landscaping treatment which is rich in tree planting. In addition, the perimeter of the power plant will be surrounded by a 3m paladin fence, which is primarily hidden behind the buffer of mitigation planting, as proposed (SD21A/0167).

Figure 14-3: Site context adjacent to permitted Gas Fired Peaking Power Plant Plant

Figure 14-4: Directly north of Profile Park is the built-up Kilbarry Industrial Park

Figure 14-5: Entrance to Grange Castle South Business Park to the west of the site

Figure 14-6: Grange Castle Golf Club in the east of the study area

14.4 PLANNING CONTEXT

The site lies solely within the jurisdiction of South Dublin County Council, and so its County Development Plan alone will be addressed in this section.

14.4.1 SOUTH COUNTY DUBLIN DEVELOPMENT PLAN (CDP) 2022-2028

The South Dublin County Development Plan 2022-2028 (SDCC CDP (2022-2028)) came into effect on 3rd August 2022, and "sets out the framework to guide future development with the focus placed on the places we live, the places we work, and how we interact and move between these places while protecting our environment."

The application site is situated within land designated as "EE - Employment and Enterprise" by the CDP's Land Use Zoning Map (see Figure 14-7 below), whose objective is *'to provide for enterprise and employment related uses'*. The CDP also outlines the types of development deemed 'Permitted in Principle' and 'Open for Consideration' none of which includes electrical infrastructure.

Figure 14-7: South Dublin Development Plan land use zoning in the location of the proposed development (indicative redline).

The Landscape Character Assessment (LCA) for SDCC is outlined in Appendix 9 of the SDCC CDP (2022-2028), defines 5 Landscape Character Areas in South Dublin, and further divides these into 10 distinct Landscape Character Types. The site is located within Landscape Character Area 2 - Newcastle Lowlands, classed as having 'Medium' sensitivity. Furthermore, the site is located within the 'Limestone Farmlands' Landscape Character Type, which is also classed as having 'Medium' sensitivity. The key characteristics of the Newcastle Lowlands Landscape Character Area that pertain to the study area entail:

- *"Low-lying and gently undulating agricultural lands over limestone.*
- *Established communication corridors include the Grand canal and railway corridor traverse east to west and two aerodromes at Weston and Baldonnel.*
- *Agricultural land use primarily pasture and tillage.*
- *Increasing influence of urban activities closer to the motorways, national roads and regional roads.*
- *Long history of historic settlement and human activity with medieval landscape complex associated with Newcastle village and surrounds.*
- *Number of demesnes associated with former country houses and institutions including reuse of older country houses at sites such as Peamount and Baldonnel."*

The Newcastle Lowlands Landscape Character Area is further described on Page 87 of the SDCC Appendix 9: Landscape Character Assessment (2022-2028) as follows:

"The Newcastle lowlands function as an important agricultural resource but vulnerable to urbanising pressures. In addition, its character as a rural landscape provides a distinct and important identity to this area of western Dublin. To conserve its sense of place requires measures protecting the integrity of the agricultural landscape by controls on urban expansion, ribbon development and other sources of erosion and fragmentation, and requires site planning guidance on the use of appropriate vernacular styles and treatments in new developments."

Relevant 'forces for change' in this landscape character area entail:

- *"Increasing urban influences that impact on the rural landscape character*
- *Fragmentation of agriculture -related habitats through piecemeal development*
- *Rural housing pressures*
- *Loss of separation distance between established urban and rural character*
- *The relatively flat and open landscape is vulnerable to adverse visual and landscape impacts of development"*

The LCA also notes (Page 67) that:

"Condition is quite variable across this LCA. The landscape closer to the urban fringe and major transport corridors tends to be more fragmented in character with hard engineering and new infrastructure (e.g. Hazelhatch train station) that have not benefitted from planting schemes that would assimilate them more sympathetically into the surrounding landscape. Within the generally flat landscape, vertical structures such as existing pylons can be seen across quite long distances."

Section 3.0 of the SDCC CDP pertains to 'Natural, Cultural and Built Heritage'. It is the Policy NCBH14: Landscapes (Page 111) to:

"Preserve and enhance the character of the County's landscapes, particularly areas that have been deemed to have a medium to high Landscape Value or medium to high Landscape Sensitivity and to ensure that landscape considerations are an important factor in the management of development."

The policy objectives relating to landscape within the South Dublin City Council CDP are outlined as follows:

NCBH14 Objective 1:

"To protect and enhance the unique landscape character of the County by ensuring that development retains, protects and, where necessary, enhances the appearance and character of the landscape, taking full cognisance of the Landscape Character Assessment of South Dublin County (2021)."

NCBH14 Objective 2:

"To ensure that development is assessed against Landscape Character, Landscape Values and Landscape Sensitivity as identified in the Landscape Character Assessment for South Dublin County (2021) in accordance with Government guidance on Landscape Character Assessment and the National Landscape Strategy (2015-2025)."

NCBH14 Objective 3:

"To ensure that development respects and reinforces the distinctiveness and uniqueness of the Landscape Character Types and retains important characteristics such as habitats, landform, vernacular heritage and settlement patterns."

NCBH14 Objective 4:

"To require a Landscape / Visual Impact Assessment to accompany all planning applications for significant proposals, located within or adjacent to sensitive landscapes and to provide mitigation measures to address any likely negative impacts."

NCBH14 Objective 5: *"To protect skylines and ridgelines from development."*

Please note that there are no designated Special Amenity Area Orders (SAAO) within the study area.

Views/Prospects of Recognised Scenic Value

Views of recognised scenic value are primarily indicated within Development Plans in the context of scenic views/routes designations, but they might also be indicated on touring maps, guide books, websites, road side rest stops or on post cards that represent the area. The SDCC CDP (2022-2028) contains designated scenic views and prospects. However, none of these are of relevance to the site.

14.5 VISUAL BASELINE

Only those parts of the receiving environment that potentially afford views of the proposed development are of concern to this section of the assessment. The proposed Profile Park 110kV substation will be built adjacent to the permitted power plant, thus will never be viewed in isolation. There is some potential for the proposed substation and permitted power plant to be viewed in combination from locally elevated or close proximity views, however in most instances the power plant and proposed substation will appear as a single, congruous development.

14.5.1 IDENTIFICATION OF VIEWSHED REFERENCE POINTS AS A BASIS FOR ASSESSMENT

Viewshed Reference Points (VRP's) are the locations used to study the likely visual impacts associated with the proposed development. It is not warranted to include each and every location that provides a view as this would make it extremely difficult to draw out the key impacts arising from the proposed development. Instead, the selected viewpoints are intended to reflect a range of different receptor types, distances and angles. The visual impact of a proposed development is assessed using up to 6 categories of receptor type as listed below:

- Key Views - from features of national or international importance;
- Designated Scenic Routes and Views;
- Local Community views;
- Centres of Population;
- Major Routes;
- Amenity and heritage features.

The Viewshed Reference Points selected in this instance are set out in Table 14.5 and shown on Figure 14-8.

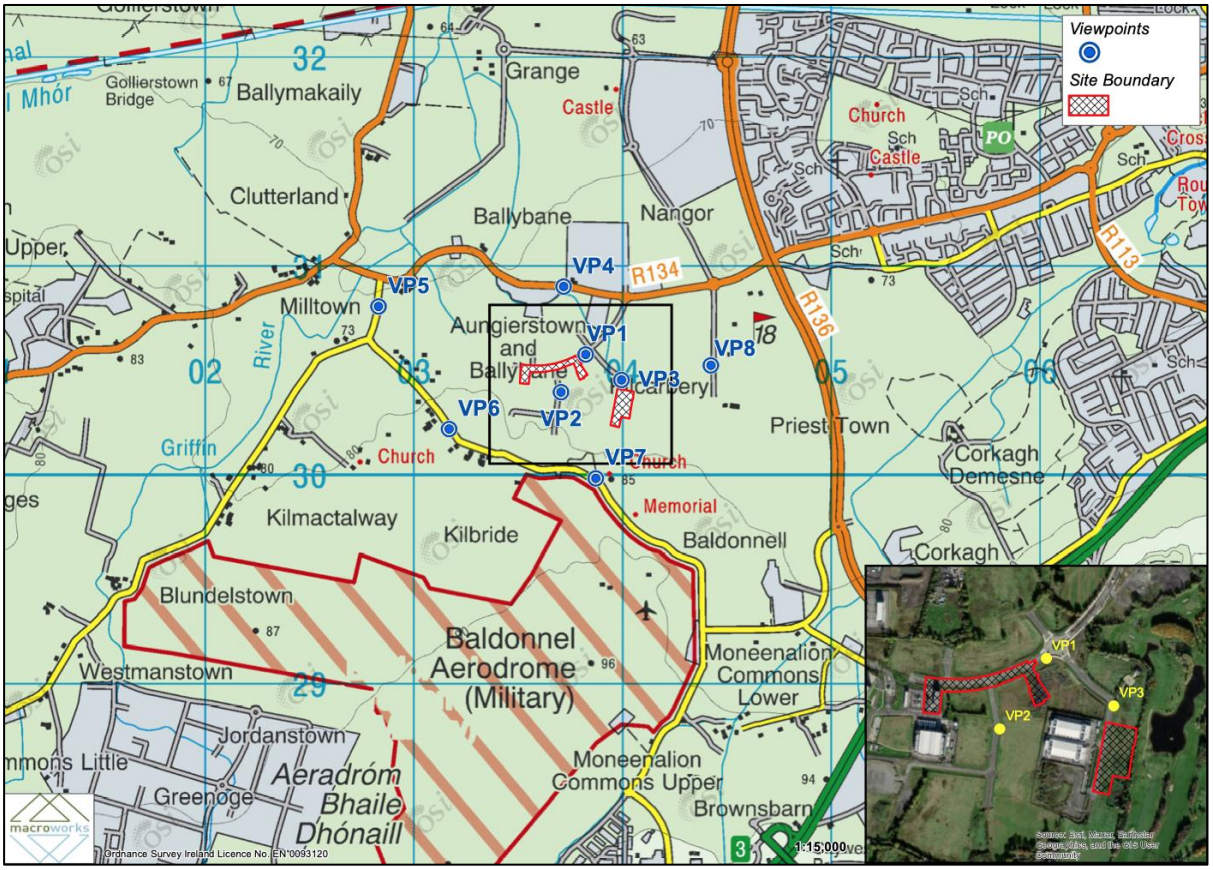

Figure 14-8: Viewpoint Selection Map

Table 14-5: Outline Description of Selected Viewshed Reference Points (VRPs)

VRP No.	*Location*	*Direction of view*
VP1	Profile Park, northeast of site boundary	S/SW
VP2	Profile Park, road west of the site	NE
VP3	Profile Park, east of the site	W/NW

VP4	R134 by Kilbarry Industrial Park	S
VP5	Entrance to Grange Castle Business Park South	SE
VP6	Entrance to Junior Genius crèche	NE
VP7	Lay-by adjacent to Baldonnel Aerodrome	N
VP8	Grange Castle Golf Club	W

14.6 MITIGATION AND MONITORING MEASURES

The main mitigation by avoidance measure employed in this instance is the siting of the proposed development in a robust, appropriately zoned business park that will avail of screening from existing and imminent built form and vegetation to minimise open visibility from within the study area. No other specific landscape and visual mitigation measures are deemed necessary in this instance.

14.7 ASSESSMENT OF SIGNIFICANT EFFECTS

14.7.1 LANDSCAPE / TOWNSCAPE EFFECTS

14.7.1.1 Landscape / Townscape Value and Sensitivity

In accordance with Section 5.5 of the GLVIA-2013, a townscape character assessment requires a particular understanding of, among other criteria, "the context or setting of the urban area and its relationship to the wider landscape." In a city that has evolved over millennia, the built infrastructure of the study area is a relatively recent addition. Having been primarily farmland up until at least the 1990s, most of the study is reflective of the peri-urban setting of west Dublin; a setting that has evolved rapidly and radically over the last quarter century.

While markers such as the Grand Canal and a small number heritage/period properties, such as that now housing the Junior Genius crèche, represent built legacies from the 18th and 19th Century, the study area has transformed extensively over the last half century. Consistent with such peri-urbanism, an overt, industrial-commercial imprint is dominant throughout the study area. As previously covered in Section 14.2.1, the site itself is a highly modified, utilitarian and anthropomorphic landscape whose integrity and landscape condition has been considerably degraded this century. This sense of industrial character is further reinforced in the immediate context of the site, given its location adjacent to the permitted Gas Fired Peaking Power Plant and just north of the existing Digital Realty data centre. In the wider vicinity, there is an existing network of electrical infrastructure to the immediate west of the proposed site, the closest of which is Barnakyle 110kV substation, located approximately 260m west of the proposed site, within Profile Park. Furthermore, the Castlebaggot 110/220kV substation, and two private substations - Cyrus One 110kV substation and a smaller 38kV substation, are located in Grange Castle Business Park South, adjacent to Profile Park. Consequently, the landscape sensitivity of this locale has been substantially devalued in recent years. Notwithstanding, there is also room for extensive residential developments as well as recreational outlets (e.g. public parks, private golf course – as previously covered in this LVIA) in the wider study area. In addition, the military

and transport infrastructure associated with Baldonnel Aerodrome occupies much of the southern half of the study area.

Nonetheless, this industrial / commercial sense of place also supports the urban economy of the local area and further afield. Thus, there is something of a productive value that is likely to be almost as important to local residents as the residential areas in which they live. But this is not a study area containing architectural conservation zones, or high-end/cutting-edge architectural developments. It is more a diverse urban neighbourhood, in which places of residence and places of work co-exist. Thus, townscape values are likely to be, overall, more utilitarian than scenic or amenity based.

As stated, the site and the study area are a highly modified, utilitarian and anthropomorphic landscape whose integrity and landscape condition has been considerably degraded this century; factors that are particularly discernible within 500m of the site. This is reflected by the location of the site on lands adjacent to the permitted Gas Fired Peaking Power Plant and just north/northwest of the existing Digital Realty data centre, which is zoned for 'Employment & Enterprise", whose principal zoning objective is, *"To provide for enterprise and employment related uses,"* as previously covered in Section 14.2.1. More broadly across the study area, the landscape values and sensitivity are reflective of those related in the aforementioned Landscape Character Assessment of South County Dublin.

In summary, the site and its immediate environs within Profile Park are considered to have a **Low** landscape/townscape sensitivity. However, the presence of recreational spaces/parks, some heritage features and farmland in the wider study area indicate a **Medium-low** townscape sensitivity, beyond the business park setting.

14.7.1.2 Do-nothing scenario

The 'do-nothing' impact refers to the non-implementation of the proposed development. The primary effect of this would be that the potential impacts of the proposed development would not occur, while the site is likely to persist in the longer term due to its current 'EE – Employment and Enterprise' zoning. Thus, a **neutral** impact will persist on the existing Landscape/Townscape.

14.7.1.3 Magnitude of Landscape / Townscape Effects

Pre-Construction

Prior to the commencement of construction activities, the area for development will be fenced off. Mobilisation will include the putting in place of temporary staff facilities, plant and equipment, materials, and systems for construction. A temporary works compound will be erected on or in the vicinity of the site for the duration of the construction works and will include temporary site offices (i.e. portacabins), staff welfare facilities, car parking, and equipment laydown areas.

Construction Phase

During the construction stage of the proposed development, which is estimated to take up to 12 months, there will be construction-related activity within and around the site, including approach roads. This will include, but is not limited to:

- HGVs transporting materials to and from the site;
- Movement of earth-moving machinery on-site;
- Temporary storage of excavated materials and construction materials on-site;
- Security hoarding and site lighting.

It is worth noting that the site is already a much-modified, anthropomorphic site zoned for such development purposes. Construction stage impacts on landscape/townscape character will be 'short-term' (i.e. lasting 1-7 years), in accordance with the EPA definitions of impact duration. Furthermore, the context of this construction activity is within an industrial area where HGV movements are frequent and there will be no site access through residential streets/estates, limiting impacts associated with construction traffic.

There is likely to be very minor impacts on the character of the recreational land use areas to the east of the site (i.e. Grange Castle Golf Club), as the construction stage works will not likely be visible, inherently screened by existing vegetation along the adjoining boundary (i.e. between Profile Park and the Golf Club). Thus, much of the clutter and activity of construction stage works will be out of view and perceptually contained within a commercial-industrial context. In addition, such construction-stage activities are a relatively regular experience for Profile Park, whose multiple vacant sites are being gradually developed, and have been over the last decade. Consequently. The magnitude of landscape/townscape impact during the construction stage is deemed to be **Medium-low**.

In combination with the Low Landscape/Townscape sensitivity designation outlined above for the site and its immediate environs, the significance of construction stage impacts is deemed to be **Slight** within the immediate industrial context of the site and its surrounds of Profile Park. However, this will quickly reduce to **Imperceptible** in the wider study area, where construction activities will be barely discernible. The quality of the construction stage effects will be **Negative** and **Temporary** in duration.

Operational Phase

Following the completion of the proposed works, landscape/townscape impacts will relate entirely to the development's impact on the character of the receiving landscape/townscape and whether this is positive or negative.

The proposed substation will be set within a dedicated business park designed for compatible purposes, and will be adjacent to industrial buildings and structures of noticeably larger scale, but similar function. The existing network of electrical infrastructure to the immediate west of the proposed site, namely Barnakyle 110kV substation, Castlebaggot 110/220kV substation, and two private substations - Cyrus One 110kV substation and a smaller 38kV substation, are located in close proximity to the proposed site. As mentioned, Grange Castle Business Park South is located west of Profile Park, while directly north of Profile Park is the built-up Kilbarry Industrial Park. In terms of impact upon the landscape character of the wider study area, this is a locale characterised by a peri-urban industrial-commercial imprint. Upon completion of construction, the proposed development will merge into its surrounds, presenting as an ancillary extension of the larger and taller developments in this industrial-commercial locality, marking a very minor increase of built fabric within the study area. In addition, the prosed development will fill a vacant site that, at present, contributes little to the urban fabric of Profile Park or the wider study area and reads as an undeveloped site in this context rather than amenity open space. For these reasons, the magnitude of landscape/townscape impact during the operational stage is deemed to be **Low.**

In combination with the Low Landscape/Townscape sensitivity designation outlined above for the site and its immediate environs, the significance of operational stage impacts is deemed to be **Slight-imperceptible** within the immediate industrial context of the site and its surrounds of Profile Park. However, this will reduce to **Imperceptible** in the wider study area, where operational activity will be barely discernible. The quality of the construction stage effects will

be marginally adverse (i.e. **Neutral-Negative)** due to the wholly utilitarian nature of the substation and **Permanent** in duration.

Decommissioning Phase

The proposed substation is expected to be operational for at least 25 years. On cessation of activities, it is envisaged that the site will either be redeveloped or reverted to its prior land use.

Decommission stage works are likely to be similar to those outlined as part of the construction stage, but of a lesser duration. Thus the significance of decommissioning stage impacts is deemed to be **Slight** within the immediate industrial context of the site and its surrounds of Profile Park. However, this will quickly reduce to **Imperceptible** in the wider study area, where decommissioning activities will be barely discernible. The quality of the decommissioning stage effects will be **Neutral** and **Temporary** in duration.

14.8 VISUAL IMPACT ASSESSMENT

14.8.1 VISUAL RECEPTOR SENSITIVITY

In this instance the same viewpoints that were used for the recent / adjacent Gas Fired Peaking Power Plant have been used as they have been established to be appropriate through that planning process. All of the viewpoints are located within relatively close proximity to each other and the site. Consequently, the receptors being represented and their associated viewing scenarios are similar for several of them. However, these receptors fall into two broader categories: that of Profile Park and its immediate hinterland, and that of the visual context beyond Profile Park.

In the first instance (i.e. that of Profile Park and its immediate hinterland), these account for **VP1, VP2, VP3** and **VP4**, which are overwhelmingly industrial-commercial in setting and character, with a negligible degree of scenic amenity. Thus, their visual receptor sensitivity is deemed to be **Low**.

However, marginally out from this context **VP5, VP6** and **VP7** are along partially tree-lined roads, which retain some remnants of the rural/agricultural sphere to their immediate west and south. As an overview of these three receptors, a modest degree of visual amenity is attainable, albeit in a somewhat disjointed, peri-urban setting. Thus, their visual receptor sensitivity is deemed to be **Medium-low**.

Lastly, **VP8** is from Grange Castle Golf Club. While it's broader setting is also peri-urban, receptors (i.e. golfers) in this context will experience a marginally higher degree of visual sensitivity. Thus, the visual receptor sensitivity at this location is deemed to be **Medium**.

14.8.2 MAGNITUDE OF VISUAL EFFECT

The assessment of visual impacts at each of the selected viewpoints is aided by photomontages of the proposed development. Photomontages are a 'photo-real' depiction of the scheme within the view, utilising a rendered three-dimensional model of the development, which has been geo-referenced to allow accurate placement and scale. For each viewpoint, the following images have been produced:

- Existing View
- Outline view
- Montage View upon completion and maturation of proposed mitigation planting

Photomontages in support of the visual assessment provided in the following pages are provided in Appendix 14-1.

VRP No.	EXISTING VIEW	VIEWPOINT SENSITIVITY	VISUAL IMPACT MAGNITUDE	SIGNIFICANCE / QUALITY / DURATION OF IMPACT
VP1	**Profile Park, northeast of site boundary** The context of this view is from within a fully enclosed and secured, private business park in peri-urban West Dublin. In that regard, the only receptors likely to be present at this location are those working in the park as there is no through-way for traffic and no unauthorised members of the public are permitted within this private commercial/industrial setting. This view is afforded from a point along the main road within Profile Park. The view faces south/southwest and depicts the imminent baseline view of the permitted Gas Fired Peaking Power Plant. The view is immediately truncated by the fence and hedgerow planting surrounding the power plant. A brief glimpse of a section of roof is afforded by a narrow gap in the vegetation. To the right-hand side of the view, the Google data centre can be identified in the background.	**Low**	The proposed development will not be visible from here due to the aforementioned intervening vegetation surrounding the permitted Gas Fired Peaking Power Plant. Thus, the magnitude of visual impact is **Negligible** by default, with a **Neutral** quality of effect.	**Imperceptible / Neutral / Permanent**
VP2	**Profile Park, road west of the site** This northeast facing view is afforded from a cul de sac road within the fully enclosed and secured, private business park. The roadside here is marginally more elevated than the site itself, affording an open view out over a currently disused greenfield area. The view depicts the imminent baseline where the permitted power plant and	**Low**	The proposed development will be visible from this location but will not represent an incongruous increase or change in form or scale. It is seen to the fore and against an immediate backdrop of the permitted power plant, matching the tone and texture. Although the proposed substation has no aesthetic merit in its own right its modest buildings will serve as a scale transition up to the permitted substation and it also helps to further break up the scale massing of the power plant buildings. The external electrical infrastructure, which is slightly complex	**Slight-imperceptible / Neutral-Negative / Permanent**

VRP No.	EXISTING VIEW	VIEWPOINT SENSITIVITY	VISUAL IMPACT MAGNITUDE	SIGNIFICANCE / QUALITY / DURATION OF IMPACT
	associated ancillary structures are a noticeable landscape feature. The power plant appears as a large industrial building with a facade of varying materials textures and tones. To the immediate south of the power plant, is the existing Digital Realty data centre, separated by a retaining wall and tall paladin fencing. Despite the somewhat open nature of the foreground, there is very little visual amenity provided in this scene, as the view is primarily contained by commercial-industrial structures.		and cluttered in appearance, gets visually absorbed against the backdrop of mitigation planting within the power plant site. For the reasons outlined above, the magnitude of visual impact is deemed to be **Low**, with a marginally adverse (**Neutral-Negative**) quality of effect.	
VP3	**Profile Park, east of site** This is another roadside view from within Profile Park, facing west/northwest. This view depicts the imminent baseline view of the permitted Gas Fired Peaking Power Plant. Similar to VP1, the view is primarily contained by the fence line and vegetation associated with the permitted power plant, behind which there is partial, intermittent visibility of the ancillary plant structures. There is also a brief view of the eastern face of the main two-storey commercial-industrial building with a three-tone symmetric matrix cladding pattern along its face.	**Low**	Viewed from this angle and location, there will be no visibility of the proposed development as a result of the intervening vegetation and the permitted Gas Fired Peaking Power Plant. On balance, the magnitude of visual impact is deemed **Negligible** by default, with a **Neutral** quality of effect.	**Imperceptible / Neutral / Permanent**

VRP No.	EXISTING VIEW	VIEWPOINT SENSITIVITY	VISUAL IMPACT MAGNITUDE	SIGNIFICANCE / QUALITY / DURATION OF IMPACT
VP4	**R134 by Kilbarry Industrial Park** The context of this regional road (also known as 'New Nangor Road') is a former country road that now winds through numerous built-up industrial developments in peri-urban West Dublin. North of this road is Kilbarry Industrial Park, with Profile Park to its south, and a car yard to the southwest. Over a low roadside hedge, a flat large pastoral field is evident for over 200m. This field is part of Profile Park, and zoned for industrial/ commercial development. A mid-distant line of mature trees obscures some views in the direction of the site, but more than 350m away, the northern face of the permitted Gas Fired Peaking Power Plant can be seen. The main two-storey commercial-industrial building can be identified by it's three-tone symmetric matrix cladding pattern along its face, with the light-tone silhouettes of the high stacks visible on the skyline. In the backdrop, the rim of the distant Dublin hills, combined with the treelines in the foreground field, allow for a moderate degree of visual amenity. However, it is worth noting that this view is at an oblique angle to road users' line of sight.	**Low**	Located over 350m away, the proposed development will be visible from this location, but slightly obscured by intervening vegetation. Viewed alongside the permitted power plant, the proposed development will not be incongruous nor visually dominant in this commercial/industrial setting, but will read as a relatively compatible land use to the industrial development in the immediate surrounds. Furthermore, given the scale of the proposed substation when viewed in comparison to the power plant, it will not represent a noticeable change or increase in the intensity of built development within the view. When viewed at this distance, the proposed substation amalgamates to appear as one of a number of ancillary structures associated with the power plant. Overall, the proposed substation is not likely to catch the eye of the casual observer and will not be a noticeable addition when viewed in conjunction with the larger, surrounding commercial-industrial structures. Thus, the proposed substation will not unduly draw from the visual amenity of this roadside setting. On balance, the magnitude of visual impact is deemed **Low-negligible,** with a **Neutral-Negative** quality of effect.	**Slight-imperceptible / Neutral-Negative / Permanent**
VP5	**Entrance to Grange Castle Business Park South**	**Medium-low**	The proposed development will not be visible from this location due to screening afforded by the intervening built development of Grange Castle South Business Park.	**Imperceptible / Neutral / Permanent**

VRP No.	EXISTING VIEW	VIEWPOINT SENSITIVITY	VISUAL IMPACT MAGNITUDE	SIGNIFICANCE / QUALITY / DURATION OF IMPACT
	This is a roadside view facing southeast, facing the entrance to Grange Castle South Business Park. In terms of context, this business park is located to the west of Profile Park, however there is no 'through road' yet established between the two business parks, however they can appear at broader distances as being one business park. In this view, the wide, high-spec entrance of the park is evident in the foreground, in terms of walls, piers, bollards, street lights etc. Within the park, to either side, mid-rise commercial/office-type buildings are apparent, blocking longer-distant views. In terms of built design, Grange Castle Business Park emphasises a business-orientated development focus, typical of IDA-supported business parks throughout the country.		The magnitude of visual impact is therefore deemed **Negligible** by default.	
VP6	**Entrance to Junior Genius crèche** By way of context, this view is located along a former country road that passes both Grange Castle South Business Park and Profile Park to the south/southwest. The view faces northeast and is primarily contained by tall roadside vegetation and trees. A brief view of Junior Genius crèche is afforded in the background, located away from the roadside and behind swathes of tall trees. Behind roadside brambles and bushes, a recolonizing/self-seeded earth stockpile	**Medium-low**	The proposed development will not be visible from this location due to screening afforded by the aforementioned roadside vegetation. Thus, the magnitude of visual impact is deemed **Negligible** by default.	**Imperceptible / Neutral / Permanent**

VRP No.	EXISTING VIEW	VIEWPOINT SENSITIVITY	VISUAL IMPACT MAGNITUDE	SIGNIFICANCE / QUALITY / DURATION OF IMPACT
	can just barely be discerned. Again, it is worth noting that while this is a roadside view, it is at an acute angle to road users' line of sight.			
VP7	**Lay-by adjacent to Baldonnel Aerodrome** This marginally elevated lay-by is on a former country road that passes both Grange Castle South Business Park and Profile Park to the south/southwest, while to the immediate south of this road is Casement Aerodrome (i.e. military airport). The view faces north, beyond a foreground of traffic-deterrent boulders, into a pastoral field beside which several aged farm sheds can be seen, to the south of Profile Park. Visible toward the background, at the centre of the view is the existing Digital Realty data centre behind which the Gas Fired Peaking Power Plant tall stacks can be discerned, punctuating the skyline.	**Medium-low**	Only the tips of the taller electrical infrastructure have the potential to be visible from this location, however they are barely discernible behind the aforementioned farm sheds. Thus, the magnitude of visual impact is deemed **Negligible**.	**Imperceptible / Neutral / Permanent**
VP8	**Grange Castle Golf Club** Grange Castle Golf Club lies adjacent to the eastern boundary of Profile Park. From within the course, the commercial/ industrial infrastructure of this peri-urban setting is frequently visible. In this instance the view faces west with the Digital Realty data centre and Gas Fired Peaking Power Plant discernible between intervening golf	**Medium**	The proposed development will not be visible from here due to the aforementioned intervening vegetation surrounding the golf course. Thus, the magnitude of visual impact is **Negligible** by default, with a **Positive** quality of effect.	**Imperceptible / Neutral / Permanent**

VRP No.	EXISTING VIEW	VIEWPOINT SENSITIVITY	VISUAL IMPACT MAGNITUDE	SIGNIFICANCE / QUALITY / DURATION OF IMPACT
	course vegetation. However, views in the direction of Profile Park are not the main source of visual amenity at this location.			

14.9 OVERVIEW OF LANDSCAPE / TOWNSCAPE AND VISUAL EFFECTS

In the landscape setting, most of the study area reflects the peri-urban setting of west Dublin; a setting that has evolved rapidly and radically over the last quarter century. Consistent with such peri-urbanism, an overt, muscular industrial-commercial imprint is dominant within the study area, and has consequently reduced the hitherto landscape sensitivity of this locale. Thus, townscape values are, overall, more utilitarian than scenic or amenity based. The site itself is a highly modified, utilitarian and anthropomorphic landscape whose integrity and landscape condition has been considerably degraded in recent years. Accordingly, the site and Profile Park are considered to have a 'Low' landscape sensitivity. However, the presence of recreational spaces/routes, some heritage features and farmland in the wider study area indicate a 'Medium-low' townscape sensitivity, in the wider context.

In terms of landscape impacts, the magnitude of construction stage landscape/townscape impacts was deemed to be 'Medium-low' within the immediate industrial context of the site and its surrounds of Profile Park, and 'Low to Negligible within the context of the wider study area. When sensitivity and magnitude judgements are combined, it resulted in a significance of townscape impact between 'Slight' and 'Imperceptible' at all stages of site development for the site itself, its immediate surrounds within Profile Park and the wider study area. During the operational phase when construction related activity has ceased, the significance of landscape / townscape effects is deemed to reduce to 'Slight-imperceptible' for the site and its immediate surrounds and then 'Imperceptible' for the wider study area.

In terms of visual receptor sensitivity, depending on the context varying between the business park and its immediate vicinity, or surrounding road-based receptors, or the adjacent Grange Castle golf club, visual sensitivity ranged from 'Low' to 'Medium.'

Due to existing and / or imminent screening by the permitted Gas Fired Peaking Power Plant and its associated landscape mitigation planting, the proposed substation is only visible from VP2 and VP4 where it is seen as a modest ancillary development against the backdrop of the Power Plant. The visual impact significance at both of these viewpoints is deemed to be 'Slight-imperceptible' and of a 'Neutral-Negative' quality. At all of the other viewpoints, the significance of visual impact is deemed 'Imperceptible'.

14.10 OVERALL SIGNIFICANCE OF IMPACT

Overall, it is considered that the proposed substation development will not result in any significant townscape or visual impacts.

16.0 MATERIAL ASSETS

16.1 INTRODUCTION

The purpose of this chapter is to describe the methodology used to assess the potential impacts from the proposed Baldonnell Substation and its associated 110kV underground cable, (hereafter referred to as the "proposed development") on the material assets in the study area. The chapter will describe the baseline environment of the material assets in the study area, assess the likely impacts and set out mitigation measures to be put in place to reduce these impacts on the material assets. The chapter considers the impacts on the material assets and not the people using the assets. The issues and impacts on people are discussed in Chapter 7 (Population and Human Health).

Material Assets are resources that are valued and that are intrinsic to specific places. These may be economic assets of human or natural origin. With regard to Material Assets, the Guidelines on the information to be contained in Environmental Impact Assessment Reports (2022) published by the Environmental Protection Agency (EPA) state:

"In Directive 2011/92/EU this factor included architectural and archaeological heritage. Directive 2014/52/EU includes those heritage aspects as components of cultural heritage. Material assets can now be taken to mean built services and infrastructure."

Material Assets of a human origin include:

- Existing Properties;
- Road Network;
- Rail Network;
- Canal Network;
- Recreational facilities and amenities;
- Public Utilities;
- Pedestrian Ways; and
- Aviation.

Material assets of a natural origin include:

- Land Resources;
- Geological Resource;
- Natural Amenities; and
- Raw Materials.

16.2 METHODOLOGY

16.2.1 Relevant Guidelines, Policy, and Legislation

The Material Assets Assessment was prepared in accordance with relevant European Union and Irish legislation and guidance, including the requirements of Annex IV of Directive 85/337/EEC of 27 June 1985 on the assessment of the effects of certain public and private projects on the environment (Environmental Impact Assessment (EIA) Directive) and in accordance with Schedule 6 of the Planning and Development Regulations 2001 as amended (S.I. No. 600 of 2001) and conforms to the relevant requirements as specified therein.

The following guidelines were referred to while preparing this appraisal:

- Guidelines on the Information to be Contained in Environmental Impact Statements (Environmental Protection Agency (EPA) 2022);
- Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (EPA 2003) (and revised advice notes (EPA 2015b);
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of the Environment, Community and Local Government 2013); and
- Environmental Impact Assessment of Projects, Guidance on the preparation of the Environmental Impact Assessment Report (European Commission 2017).

16.2.2 Data Collection Methods

As part of the compilation of this EIAR chapter, the previously discussed guidance, and advice documents were studied in order to fully understand the constraints in a study area around the proposed development and the associated gas fired power plant in Profile Park. This study area was defined as relating to the closest materials assets as set out in Section 16.1.

Material assets were identified through consultation and a review of available datasets and mapping.

16.2.3 Consultation

Consultation was undertaken for the approved gas fired power plant (SD21A/0167) with the following organisations to determine what existing infrastructure is present within the proposed works area. Mapping, where provided by these organisations, was overlaid with the project mapping and assessed.

- Moffash Limited (Profile Park owners) who provided details of all relevant utilities in Profile Park including:
  - Telecommunications.
  - Water mains.
  - Foul sewers.
  - Electrical infrastructure.
- EirGrid/ESB
- Gas Networks Ireland.
- Irish Water; and
- Department of Defence.
- Digital Netherlands VIII B.V (DRT), adjacent landowner.
- Google Ireland Limited, adjacent landowner.
- Vantage Data Centers DUB11 Limited, adjacent landowner.

16.3 BASELINE ENVIRONMENT

16.3.1 Baseline Environment – Material Assets of Human Origin

16.3.1.1 Existing Properties

The site of the proposed development is located in Profile Park, Dublin 22. This is a 100 acre (40.5 Ha) fully enclosed, private business park. Existing tenants within Profile Park and the surrounding business and enterprise parks include Google, Microsoft, Digital Realty Trust, Telecity and others. Digital Realty Trust (DRT) is located immediately adjacent to the proposed development.

There are no residential receptors within 350m of the proposed development site. The closest receptors are on the Baldonnel Road to the south of the site and the R134 to the north of the site.

16.3.1.2 Road Network

The proposed development is located within the Profile Park Business Park and will be accessed from the R134 New Nangor Road. The access to Profile Park is situated within an 60km/h default urban speed zone. The R134 New Nangor Road has a carriageway width of approximately 7.3m in the vicinity of the access to Profile Park. The R134 also provides a fully segregated two-way cycle facility on its northern side along with a 2.25m width footpath. Tactile paving crossing points and street lighting are present at the junctions along with roadside bus stops.

16.3.1.3 Rail Network

The national rail network is located approximately 2.3km to the north of the proposed development at its closest point.

16.3.1.4 Canals

Canals are artificial linear bodies of water that were originally constructed for the purpose of navigation. The Grand Canal is located approximately 1km to the north of the proposed development at its closest point.

16.3.1.5 Recreational Facilities and Amenities

As discussed in Section 7.3.1.6, some of the attractions within the vicinity of the proposed development are:

- Grange Castle Golf Course is the closest tourist attraction to the proposed development; Located approximately 221m southeast of the site. The course is owned by South Dublin County Council.
- Corkagh Park is located 1.28km southeast of the proposed development. The park is approximately 120 hectares in size and originally formed part of a manor house and estate,
- Clondalkin Round Tower is built on the site of a monastery and dates to the 7th century. It is located approximately 3.23 km northeast of the proposed development and is one of only four remaining round towers in Dublin.
- The largest attraction to the proposed development is the Dublin Mountains Park, which is located approximately 5.24 km to the south, providing high quality recreation amenity and experience for both domestic and overseas visitors.

16.3.1.6 Public Utilities - Gas Network

Natural gas, supplied from Gas Networks' Ireland (GNI) national grid, will be the primary fuel source for the associated gas fired power plant. The proposed development is approximately 1km from an existing GNI compound located in the Grange Castle Business Park. Greener Ideas Limited has signed a Large Network Connection Agreement with GNI, who are presently finalising the detailed design of the gas connection to the site.

16.3.1.7 Public Utilities - Power Infrastructure

There is existing ESB electrical ducting within the road system providing coverage throughout Profile Park.

The electrical generator associated with the gas fired power plant will be connected to a 15/110kv transformer. The power plant will generate electricity at a voltage of 15kV, with the transformer increasing this voltage to 110kV. The electrical power will then be exported to the national electricity grid via a 110kV underground cable, connected to the existing Barnakyle substation. This substation is located approximately 250m to the west of the development. Greener Ideas have signed a connection agreement with EirGrid that details this method of connection to the grid.

16.3.1.8 Public Utilities - Communications Infrastructure

Telecoms infrastructure is present throughout Profile Park. Profile Park is connected directly onto the Dublin metropolitan fibre network called the T50. The T50 is a multi-duct fibre carrying system which extends over 44 km and provides connectivity to 24 business parks and from these into the global network.

16.3.1.9 Public Utilities - Water Supply Infrastructure

Water supply infrastructure comprises water mains, water network junctions, water hydrant etc. The closest infrastructure to the proposed development is a water main located immediately adjacent to the proposed development site in the existing Profile Park road system.

16.3.1.10 Public Utilities - Wastewater Collection Infrastructure

Wastewater infrastructure comprises foul water sewers, pump stations, manholes, treatment plants, etc. The closest wastewater infrastructure to the proposed development is a 225 mm foul sewer which is located immediately adjacent to the proposed development site, in the existing Profile Park road system.

16.3.1.11 Pedestrian Ways

Profile Park contains substantial pedestrian footpaths, which provide access throughout the park. However, it should be noted that Profile Park is a private estate, with no public access. A security hut and gate monitor vehicular and pedestrian access, only permitting those with business in the park to enter.

16.3.1.12 Aviation

The site of the proposed development has the following characteristics in relation to proximity to the Department of Defences Casement Aerodrome which is located to the south:

- The site lies under the “Inner Horizontal Surface” of Casement Aerodrome, as defined by the International Civil Aviation Organization. Which is at an elevation of 131.6m OD (i.e., at 57m above ground level on the site).
- The site also lies within Casement Aerodrome’s “Inner Zone” which is a circle of 2km radius centred at the centre point of Casement’s main runway: this is not an ICAO surface, but a Department of Defence restriction.
- The site lies at a lateral distance of approximately 1.4km-1.55km from the centreline of Casement’s main Runway 10/28. And at a lateral distance of approximately 0.8km-1km from the extended centreline of Casement’s subsidiary Runway 04/22.

- However, no part of the site, lies under any of Casement Aerodrome's more significant Obstacle Limitation Surfaces, such as Approach Surfaces, Take-Off Climb Surfaces, or Transitional Surfaces. No part of the site lies under any of Weston Airport's or Dublin Airport's Obstacle Limitation Surfaces.
- The site, with ground level at 74.6m OD, is low-lying in relation to Casement Aerodrome, i.e., at 12m below the aerodrome's datum (of 86.6m OD), and at 22.6m below the aerodrome's published 'aerodrome elevation' (97.2m OD).

16.3.2 Baseline Environment - Material Assets of Natural Origin

16.3.2.1 Land Resources

The site of the proposed development is located in Profile Park, which is a fully enclosed, private business park, that has been developed to the highest of architectural standards. The site has been identified by South Dublin County Council in its County Development Plan 2022-2028, as Zoning Objective 'EE' which is '*To provide for enterprise and employment related uses'*.

16.3.2.2 Geological Resources

There are no Geological Heritage Sites within 2km of the proposed development.

16.3.2.3 Natural Amenities (watercourses)

Natural amenities (watercourses) are considered and assessed in Chapter 12 (Biodiversity) and Chapter 9 (Hydrology and Hydrogeology).

16.3.2.4 Raw Materials

Raw materials (e.g., wood, steel, stone, sand etc.) required during the construction phase of the proposed development will be sourced from local suppliers, where possible. However, some of the equipment parts required for the substation may not be manufactured in Ireland and these will have to be imported.

16.4 ASSESSMENT OF SIGNIFICANT EFFECTS

16.4.1 Do Nothing Scenario

Should construction of the proposed substation not be developed, there will be no impact on any of the material assets detailed in Section 18.3, including existing properties, road network, rail network, canal network, recreational facilities and amenities, public utilities, pedestrian ways, aviation, land resources, geological resource, natural amenities (watercourses) and raw materials.

However, under this same scenario, there would be no method for exporting electricity generated at the adjacent Gas Fired Peaking Power Plant to the wider transmission grid. Furthermore, the power plant would become a "stranded asset." This in turn will impact This in turn will impact EirGrid's ability to provide a safe and secure electricity network in the Dublin region.

16.4.2 Do Something Scenario

Should the proposed development proceed as planned, it will impact upon material assets in the vicinity of the proposed works. The proposed substation and its associated grid connection has been designed to take account of the identified material assets and the implementation of the

mitigation measures outlined in Section 16.5, will help reduce any negative impact on these material assets.

16.4.3 Construction Phase Effects

16.4.3.1 Existing Land/Properties

Access will be required to third party lands to allow construction works to be completed for the grid connection. However, construction practices will ensure that any impacts regarding accessibility will be minimised.

16.4.3.2 Road Network

Traffic on the road network generated by the construction phase of the proposed development will primarily consist of traffic related to either delivery of construction materials, or removal of excavated material from the site for disposal. Construction Phase staff will also generate trips to and from the construction site. The traffic impact on the road network during the Construction Phase will have slight negative temporary effects.

Where roads are opened for the installation of electrical cables, moderate negative temporary effects are likely to arise on these roads during construction.

16.4.3.3 Rail Network

There will be no interface and therefore no impact arising from the proposed development on the rail network.

16.4.3.4 Canal Network

There will be no interface and therefore no impact arising from the proposed development on the canal network.

16.4.3.5 Recreational Facilities and Amenities

It is not considered that the proposed development will have any direct or negative impact on tourist amenities. In addition, there are no anticipated negative effects arising from construction for local recreational facilities or amenities.

16.4.3.6 Public Utilities

The laying of underground electrical cables and a gas pipeline as part of the overall project works, has the potential to directly impact the electrical and gas network service.

Water supply and wastewater collection infrastructure is present and has the potential to be directly impacted by construction excavation works.

Communications infrastructure is also present throughout the study area. There is potential for unidentified utilities to be damaged during the construction phase. Utilities will be further identified and mapped during the detailed design stage.

Potential slight negative temporary impacts on public utilities could arise during the construction of the proposed substation.

16.4.3.7 Pedestrian Ways

No public pedestrian ways will be impacted by the proposed development.

16.4.3.8 Aviation

It should be noted that the main aviation receptor to the proposed development is Casement Aerodrome, which is located approximately 1km to the south. As part of the overall project, Greener Ideas Limited consulted with the Department of Defence in relation to potential effects on Casement Aerodrome arising from the associate gas fired power plant. As part of these consultations an aviation impact study was prepared and approved by the Department of Defence. This study concluded that '*Overall, it is considered that the permitted power plant development at Profile Park complies with all aviation and aeronautical requirements affecting the location*'.

For the proposed development, it is anticipated that the main issues to be addressed will be the use of cranes on site during construction. Details of crane use is advised to Casement Aerodrome, at least 30 days in advance of use on site. It is predicted that there will be a short term, negative and slight impact on aviation during construction.

16.4.3.9 Land Resources

Any existing material assets are located either overground or underground, in a built-up urban environment. There are no existing material assets on the site of the proposed substation. There are material assets along the proposed grid connection route and future gas connection. However, these assets are development in built up 'made' land. Therefore, an imperceptible negative effect on land-take is predicted.

16.4.3.10 Geological Resources

There are no Geological Heritage Sites within 2km of the proposed development. There will be no direct or indirect effects on geological resources arising from the construction of the proposed substation.

16.4.3.11 Natural Amenities (e.g., watercourses)

There are potential surface water quality impacts associated with the proposed substation which could indirectly impact watercourses, these would be common to most construction sites in the absence of control measures or mitigation (see Chapter 9 (Hydrology and Hydrogeology).

16.4.3.12 Raw Materials

Raw materials (e.g., wood, steel, stone, sand etc.) required during the construction phase of the proposed development will be sourced from local suppliers, where possible. However, some of the equipment parts may not be manufactured in Ireland and these will have to be imported. The proposed development may also require the use of some non-renewable materials. However, consideration will be given to the sustainable sourcing of all raw materials and materials will be reused where possible. Methodologies will be chosen at design stage to decrease the amount of imported material required. There will be an imperceptible, negative and permanent impact on raw materials as a result of the proposed substation.

16.4.4 Operational Phase Impacts

16.4.4.1 Existing Properties

During its operations phase, the proposed substation along with the associated gas fired power plant, which will operate in accordance with its Industrial Emissions Licence (IEL). Emissions or impacts on the nearest receptors will be regulated by the Environmental Protection Agency in accordance with the plants IEL. There will be imperceptible, brief effects on existing properties during the operational phase.

16.4.4.2 Road Network

The traffic generated by the Operation Phase has also been considered in the TTA (Appendix 15-1). The operational traffic for the proposed development and the associated power station is expected to be less than 5 vehicle movements per day. The potential effects of the Operation Phase on the capacity and operation of the receiving road network are considered to be negligible.

16.4.4.3 Rail Network

There will be no direct or indirect impacts on the rail network arising from the proposed development. The project will therefore have a neutral effect on the rail network.

16.4.4.4 Canal Network

There will be no direct or indirect impacts on the canal network arising from the proposed development. The project will therefore have a neutral effect on the canal network.

16.4.4.5 Recreational Facilities and Amenities

There will be no direct or indirect impacts on recreational facilities and amenities arising from the proposed development. The project will therefore have a neutral effect on recreational facilities and amenities.

16.4.4.6 Public Utilities

During operation the proposed Baldonnell Substation will export electricity to the existing Barnakyle substation within Profile Park.

The associated gas fired power plant will be supplied with incoming gas.

The national distribution and transmission system operated by ESB Networks and EirGrid and the national gas network operated by GNI would facilitate these connections subject to commercial agreement.

The proposed substation will facilitate the transmission of power to the grid to support renewable energy integration. Therefore, the proposed substation along with the associated gas fired power plant would have a positive and long-term effect on public utilities.

16.4.4.7 Pedestrian Ways

There will be no direct or indirect impacts on pedestrian ways arising from the proposed development. The project will therefore have a neutral effect on the pedestrian ways.

16.4.4.8 Aviation

It should be noted that the main aviation receptor to the proposed development is Casement Aerodrome, which is located approximately 1km to the south. As part of the overall project, Greener Ideas Limited consulted with the Department of Defence in relation to potential effects on Casement Aerodrome, arising from the associated gas fired power plant. As part of these consultations an aviation impact study was prepared and approved by the Department of Defence. This study concluded that '*Overall, it is considered that the permitted power plant development at Profile Park complies with all aviation and aeronautical requirements affecting the location*'.

A summary is provided below of the main findings of the aviation impact study that pertain to the operational phase of the substation and its associated power plant.

- The site at Profile Park lies clear of all Approach Surfaces, Take-Off Climb Surfaces, and Transitional Surfaces at Casement Aerodrome, which are the more important Obstacle Limitation Surfaces [as defined by the International Civil Aviation Organization (ICAO) and by the European Aviation Safety Agency (EASA)].
- The site is also clear of all Surfaces for Weston and Dublin Airports.
- The site lies under Casement's Inner Horizontal Surface, that is at 131.6m OD. The site is at 74.6m OD, so the highest part of the proposed development, the lightning masts, are at 92.6m OD. The masts are therefore 39m below Casement's Inner Horizontal Surface.
- The site is also located within Casement Aerodrome's 'Inner Zone'. This is not an ICAO surface, but a Department of Defence defined area where no buildings or structures exceeding 20 metres in height above ground level are permitted. The substation's lightning mast are 18m high so do not exceed this limit.

The project will therefore have a neutral effect on the operations of Casement Aerodrome.

16.4.4.9 Land resources

The proposed development will be cited on a greenfield site which is zoned for enterprise and employment infrastructure of this nature. There will be a long-term impact on land use and a moderate negative effect on the land resource.

16.4.4.10 Geological Resource

There will be no direct or indirect impacts on geological resources arising from the proposed development. The project will therefore have a neutral effect on geological resources.

16.4.4.11 Natural Amenities (e.g., watercourses)

There will be no significant direct or indirect impacts on natural amenities arising from the proposed development. The project will therefore have a neutral effect on natural amenities.

16.4.4.12 Raw Materials

There will be no direct or indirect impacts on raw materials arising from the proposed substation. The project will therefore have a neutral effect on raw materials.

16.5 MITIGATION AND MONITORING MEASURES

Following an assessment of the potential impacts, the proposed substation was methodically reviewed, and mitigation methods were developed that will avoid, prevent or reduce any negative effects on the environment.

16.5.1 Construction Phase

16.5.1.1 Existing Land/Properties

There are no mitigation measures relating to existing properties outside of Profile Park. Within Profile Park, impacts on the neighbouring Digital Realty data centre will be mitigated in accordance with the Construction and Environmental Management Plan (CEMP) which is included in Appendix 3-2. In summary, the application of general construction best practise will ensure limited nuisance is experienced at this location.

16.5.1.2 Road Network

The proposed works will require the crossing of road infrastructure and the opening of the road to lay underground electrical cables and a gas pipeline. Chapter 15 (Traffic and Transport) details specific mitigation measures to be undertaken during the construction phase to eliminate and reduce any impacts on the road network.

16.5.1.3 Public Utilities

During the project detailed design stage, further consultation will be undertaken with all communication utility providers to confirm the current locations of their infrastructure. This information will be considered in the detailed design of the project and the infrastructure avoided where possible.

16.5.1.4 Aviation

While it is unlikely that any cranes used during construction will reach the level of the aerodrome's Inner Horizontal Surface, it will be necessary, under S.I. 215 of 2005 – 'Irish Aviation Authority (Obstacles to Aircraft in Flight) Order', for prior notification of the use of any cranes to be submitted, at least 30 days in advance, to the Irish Aviation Authority and to Casement Aerodrome.

16.5.1.5 Land Resources

All impacts will be mitigated in accordance with the CEMP which is included in Appendix 3-2. In summary, the application of general construction best practise will ensure limited nuisance is experienced at this location.

16.5.1.6 Geological Resource

No specific mitigation measures are required during the construction phase with regards to geological resources.

16.5.1.7 Natural Amenities (e.g., watercourses)

Mitigation measures for the protection of watercourses are detailed in Chapter 9 (Hydrology & Hydrogeology) and will be adhered to throughout the construction phase.

16.5.1.8 Raw Materials

Consideration will be given to the sustainable sourcing of all materials. Materials will be reused where possible. The methodologies chosen at design stage, will result in a decrease in the amount of imported material, which in turn will reduce the impact of traffic on the surrounding roads and will result in less demand on non-renewable sources such as quarries.

Other mitigation measures which will be employed in relation to raw materials are as follows:

- Design will be optimised to minimise the requirements for raw materials;
- Materials will be reused where possible;
- Raw materials will be sourced locally where possible; and
- Raw materials will be managed in accordance with the CEMP for construction.

16.5.2 Operation phase

There are no mitigation and monitoring measures required during the operation of the proposed Baldonnell Substation.

16.6 CUMULATIVE EFFECTS

Material assets will interact with other EIAR topics given the nature of the works. Project related traffic will also interact with the land resource in the area which are a mixture of industrial, urban and agricultural.

Mitigation measures have been proposed within this EIAR to eliminate and reduce any adverse effects from this interaction on the land. The raw materials needed for the project also interact with the project traffic. The methodologies chosen at design stage will seek to result in a decrease in the amount of imported material, where feasible, which in turn will reduce the impact of traffic on the surrounding roads and will result in less demand on non-renewable sources such as quarries.

When roads are opened for the installation of the proposed grid connection cable or for the gas pipeline, interaction will occur between material assets (namely the local road network and utility providers), traffic and population. Further consultation will be undertaken with utility providers in the project detailed design stage and mitigation measures put in place to minimise any adverse impacts.

With regard to the cumulative impact of the interactions of impacts, it is unlikely that any of these interactions will result in significant additional impacts that are not already anticipated in this EIAR.

16.7 RESIDUAL IMPACTS

The material assets identified in the study area are considered to be typical infrastructure frequently encountered in civil engineering infrastructure projects, in both rural and urban environments. As such, it is considered that the resulting predicted impacts on material assets from the proposed development will be positive, slight and permanent.

16.8 REFERENCES

- European Union (1985). Directive 85/337/EEC of 27 June 1985 on the assessment of the effects of certain public and private projects on the environment [1985].
- European Union (2014). Directive 2014/52/EU of 16 April 2014 on the assessment of the effects of certain public and private projects on the environment [2014].
- Planning and Development Regulations 2001 – S.I. No. 600 of 2001
- Department of the Environment, Community and Local Government (2013). Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment.
- European Commission (2017). Environmental Impact Assessment of Projects, Guidance on the preparation of the Environmental Impact Assessment Report.
- Environmental Protection Agency (2002). Guidelines on the Information to be Contained in Environmental Impact Statements.
- Environmental Protection Agency (2003). Advice Notes on Current Practice in the Preparation of Environmental Impact Statements.
- Environmental Protection Agency (2015a). Advice Notes for Preparing Environmental Impact Statements.
- Environmental Protection Agency (2015b). Revised Guidelines on the Information to be Contained in Environmental Impact Statements.
- Environmental Protection Agency (2022). Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.

17.0 MAJOR ACCIDENTS AND DISASTERS

17.1 INTRODUCTION

This chapter assesses the potential for significant effects on the environment arising from the vulnerability of the proposed substation to risks of major accidents and/or disasters, given the location of the proposed substation and connection to the adjacent gas fired power plant.

This chapter seeks to determine:

- The likelihood of the proposed substation to act alone and/or to interact with the gas fired power plant to act as a source of hazard;
- The relevant major accidents and/or disasters, if any, that the adjacent and associated gas fired power plant could be vulnerable through the construction, operation and decommissioning phases;
- The potential for these major accidents and/or disasters to result in likely significant adverse environmental effect(s); and
- The measures that are in place, or need to be in place, to prevent or mitigate the likely significant adverse effects of such events on the environment.

17.2 METHODOLOGY

17.2.1 Context

The methodology for this assessment is based on the following requirements which is set out in Schedule 6 of the Planning and Development Regulations, 2001, as amended:

"a description of the expected significant adverse effects on the environment of the proposed development deriving from its vulnerability to risks of major accidents and/or disasters which are relevant to it. Relevant information available and obtained through risk assessments pursuant to European Union legislation such as the Seveso III Directive or the Nuclear Safety Directive or relevant assessments carried out pursuant to national legislation may be used for this purpose, provided that the requirements of the Environmental Impact Assessment Directive are met.

Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for, and proposed response to, emergencies arising from such events".

17.2.2 Site Specific Risk Assessment Methodology

A site-specific risk assessment has been carried out, which identifies and quantifies risks focusing on unplanned, but possible and plausible events occurring during the construction and operation of the associated gas fired power plant. This approach is derived from the EPA Guidelines on information to be contained in EIAR (EPA 2022).

The criteria for categorising impact is derived from the EPA's Guidance on Assessing and Costing Environmental Liabilities (2014). In this guidance, the risk assessment methodology commences with the establishment of risk classification criteria followed by risk analysis based on these criteria. Risk classification tables are required in order to evaluate and rank the risks compared with each other. They form the basis for rating the likelihood of an event occurring

and the consequence of impact if the event occurs. The likelihood and consequence ratings are combined to form a risk score for risk evaluation (see Table 17-1 and Table 17-2)

Table 17-1: Risk Classification - Likelihood [1]

Rating	Category	Description
1	Very low	Very low chance of hazard occurring
2	Low	Low chance of hazard occurring
3	Medium	Medium chance of hazard occurring
4	High	High chance of hazard occurring
5	Very high	Very high chance of hazard occurring

Table 17-2: Risk Classification - Consequence[2]

Rating	Category	Description
1	Trivial	No impact of negligible change to the environment
2	Minor	Minor impact/localised or nuisance occurring
3	Moderate	Moderate impact to environment of hazard occurring
4	Major	Severe impact to environment
5	Massive	Massive impact to a large area, irreversible in medium term

The risks are the ranked according to their own risk score in a colour coded matrix table which allows risks to be easily displayed and prioritised. The colour codes are as follows:

- Red – high level risks requiring priority action;
- Yellow – medium-level risks requiring action, but not as critical as red-coded risks; and
- Green (light and dark) – low-level risks requiring continuing awareness and monitoring on a regular basis.

17.3 BASELINE ENVIRONMENT

17.3.1 Dublin Region Climatic Events

The graphic below sourced from South Dublin County Councils Climate Change Action Plan 2019-2024 summarises the climatic events recorded by Met Éireann that have occurred in the

[1] EPA (2014) Guidance on Assessing and Costing Environmental Liabilities

[2] EPA (2014) Guidance on Assessing and Costing Environmental Liabilities

Dublin Region over the last 32 years. These events were recorded due to their unique intensity and abnormal weather patterns. The effects of these major events are not purely economic; they also highlight social and environmental impacts and vulnerabilities.

TYPE	DATE	DESCRIPTION
Hurricane Charley	August 1986	Pluvial – worst flooding in Dublin in 100 Years.
Pluvial & Strong Winds	February 1990	Heavy rain and consequently flooding, with long periods of strong winds. All weather stations reported gale gusts.
Pluvial/Fluvial	June 1993	100 mm of rain fell in Dublin and Kildare (more than three times the normal amount).
Extreme Temperatures	June - August 1995	Warmest summer on record, with mean air temperatures over two degrees above normal in most places. Temperatures rose to around 30°C on a number of days and night time minimum temperature remained above 15°C for many weeks.
Windstorm	December 1997	Conditions were severe in much of Leinster, especially the south and east. In the Dublin area there were record gusts of 150 km/h, with maximum 10-minute winds of storm force.
Fluvial	November 2000	250 properties flooded in Dublin, 90.8 mm of rain fell. Significant disruption and damage.
Fluvial	November 2002	Similar to the 2000 flood, 80 mm of rain fell in Dublin.
Extreme Temperatures	Summer 2006	Warmest summer on record since 1995.
Pluvial	August - September 2008	76 mm of rain fell at Dublin Airport. Severe flooding in areas, many of which had no previous history of such flooding. Over 150 residential properties were inundated, as well as commercial premises, public buildings, major roadways, etc.
Pluvial	July 2009	This was a 1-in-50-year event. Several areas within the Dublin Region were severely affected.
Extreme Cold	December 2010	It was the coldest of any month at Casement Aerodrome in 50 years. Casement Aerodrome's temperature plummeted to -15.7°C on Christmas Day, the lowest temperature ever recorded in the Dublin Region.
Pluvial/Fluvial	October 2011	This was between a 1-in-50 and a 1-in-100-year event across the majority of Dublin. Properties and roads were flooded, some electricity customers had no power supply in the County.
Storm Darwin	February 2014	1-in-20 year event, with gusts of 100-110 km/h in Dublin. Considerable damage to housing and other buildings. 8,000 ha of forests damaged. Status: Yellow
Storm Ophelia	October 2017	First storm to come from a southerly direction, with damaging gusts of 120 to 150 km/h. 100 large trees blown over in the Dublin Region and significant damage to buildings throughout the country. Status: Red
The Beast from the East and Storm Emma	February – March 2018	Met Éireann issued its first Status Red warning for snow on record. Closure of all schools in the country, many businesses affected, water and power restrictions or outages. Status: Red
Extreme Temperatures	Summer 2018	Drier and warmer weather than normal throughout Ireland, with drought conditions in many areas, including Dublin. Temperatures reached 28°C, with above-average sunshine and heat wave conditions. Water restrictions were in place for the country for most of the summer. Status: Yellow
Storms Ali and Bronagh	September 2018	Storm Ali brought widespread, disruptive wind, which led to the delay or cancellation of most flights to and from Dublin Airport. Storm Bronagh passed over the east of Ireland bringing heavy rain. Mean wind speeds between 65-80 km/h and gusts between 110-130 km/h. Status: Orange

17.4 ASSESSMENT OF SIGNIFICANT EFFECTS

17.4.1 Do Nothing Scenario

In the do-nothing scenario, the potential risk of the proposed development causing, or being affected by a disaster and/or major accident would be eliminated as the project would not be progressed.

17.4.2 Application of Seveso Directive

The inventory of substances to be stored on the proposed Baldonnell Substation site by nature is not subject to any of the requirements contained in the Chemical Act (Control of Major Accident Hazards involving Dangerous Substances) Regulations 2015 which implement the Seveso III Directive, the main EU legislation dealing specifically with the control of onshore major accident hazards involving dangerous substances, into Irish law.

17.4.3 Potential Major Accidents or Disasters

Table 17-3 sets out the potential major accidents and disasters which have been considered in the context of the proposed development and the associated gas fired power plant.

Table 17-3: Summary of Major Accidents

Ref.	Process	Potential Risk of Major Accident	Phase	Impact	Consequence Rating	Basis of Consequence	Likelihood Rating	Basis of Likelihood	Risk Score
1	Extreme heat or cold weather	Extremities could result structural damage and/or pollution to soils, groundwater or surface waters	Construction / Operation / Decommissioning	Human health, biodiversity, soils and geology, hydrology and hydrogeology	2	The proposed substation and the associated gas fired power plant will be constructed, operated and decommissioned in accordance with all relevant planning, building and environmental licencing codes. Noting that the substation element of the project will not be decommissioned.	1	The proposed substation and the associated gas fired power plant is not considered to be at risk during storms or during extreme heat or cold event, any more so than other significant buildings or structures.	2
2	Storm events	Storm events could result structural damage and/or pollution to soils, groundwater or surface waters	Construction / Operation / Decommissioning	Human health, biodiversity, soils and geology, hydrology and hydrogeology	2	As above	1	As above	2
3	Flooding	Project could be at risk of flooding or give rise to flooding at downstream locations	Construction / Operation / Decommissioning	Hydrology	2	The site of the approved power plant is not at risk of pluvial or fluvial flooding. the risk of pluvial flooding associated with the proposed	2	Based on the indicative flood mapping produced as part of the National PFRA Study, the site of the power plant is not at risk of fluvial flooding from watercourses in the area. The topography of the site also provides a	4

Ref.	Process	Potential Risk of Major Accident	Phase	Impact	Consequence Rating	Basis of Consequence	Likelihood Rating	Basis of Likelihood	Risk Score
						development is minimal.		natural overland flow path to convey water away from the essential infrastructure. It is calculated that the stormwater management system proposed as part of the development will limit runoff from the site to greenfield runoff rates, therefore mitigating against an increase in flood risk elsewhere. For the proposed development, a Flood Risk Assessment has found that the development will have an imperceptible impact on flood risk upstream/downstream of the subject site, and that the risk of fluvial flooding associated with the development will be minimal.	
4	Pollution to soils / groundwater / surface waters	Pollution to soils, groundwater or surface waters	Construction / Operation / Decommissioning	Human health, biodiversity, soils and geology, hydrology and hydrogeology	3	In order to mitigate potential impacts during the construction phase, best practice construction methods will be implemented in order	1	The construction phase of the proposed development will be carried out in accordance with good practice construction methodologies, all relevant health and	3

Ref.	Process	Potential Risk of Major Accident	Phase	Impact	Consequence Rating	Basis of Consequence	Likelihood Rating	Basis of Likelihood	Risk Score
						to prevent water (surface water and groundwater) pollution		safety guidance and legislation, as well as the provisions of the CEMP, as detailed in this EIAR.	
5	Failure of emissions abatement control systems	Atmospheric emissions which exceed EPA Industrial Emissions Licenced parameters	Operation	Impact on air quality, human health, biodiversity	2	Low change of increased emission levels occurring, as CEMS in place for detection	2	This is not a likelihood for the proposed development. However, Continuous Emission Monitoring Systems (CEMS) will be provided to monitor the gas fired power plant's emissions to atmosphere as required by Industrial Emissions licence.	4
6	Gas Engine operations	Leak of natural gas	Operation	Potential impact on adjacent properties. Potential fire and smoke.	4	Only small leaks are credible.	1	This is not a likelihood for the proposed development. However, the gas engine in the gas fired power plant will be protected from fire using a water mist based extinguishing system as well as optical flame detection, hydrocarbon sensing and thermal detectors. The engines will be fitted with pressure monitoring to detect a pressure drop and a gas detection system that will be interlocked with	4

Ref.	Process	Potential Risk of Major Accident	Phase	Impact	Consequence Rating	Basis of Consequence	Likelihood Rating	Basis of Likelihood	Risk Score
								the plant control system.	
7	Gas Engine operations	Leak of natural gas	Operation	Temporary offsite air quality impact due to release of combustion gases	4	Only small leaks are credible.	1	This is not a likelihood for the proposed development. However, regular inspection and maintenance of the gas engines systems in the gas fired power plant and testing of emissions will take place.	4
8	Gas engine operations	Leak from the lubricating oil cooling system	Operation	Potential on-site health impact due to inhalation of lubricating oil vapours. Risk of fire. Possible environmental contamination of soils and ground water.	2	Lubricating oil will not be volatile; therefore, potential for offsite migration of vapours would be limited. The lubricating oil cooling system will be bunded. This bund will retain any leaks.	2	This is not a likelihood for the proposed development. However, the lubricating oil cooling system of the gas fired power plant will be subject to regular inspection and maintenance to avoid leaks.	4
9	Station transformer	Fire in a transformer resulting in emissions of combustion products	Operation	Temporary off site air quality impact	2	All outdoor transformers will be bunded, blast protected and fire protected according to EirGrid standards and relevant international standards such as NFPA 850.	2	Standard transformer protection systems such as Bucholz relays will be used	4

Ref.	Process	Potential Risk of Major Accident	Phase	Impact	Consequence Rating	Basis of Consequence	Likelihood Rating	Basis of Likelihood	Risk Score
						Transformer oil is of low volatility. The process control system would shut down the plant in the event of a fire being detected in the transformer building/area. Rapid dispersion of combustion gases would occur.			
10	Tanker unloading / delivery operations	Spillages	Operation	Risk of contamination of soils or groundwater	3	Diesel oil is a stand by fuel only and tanks will be replenished only in rare circumstances. The plant will operate on gas and only on diesel oil in emergency scenarios.	1	Where refuelling is to take place on the proposed development site and on the gas fired power plant site, it will be in bunded areas which will be the subject of regular inspection and integrity testing in line with IE Licence conditions.	3
11	Low sulphur diesel oil storage tank	Leaks	Operation	Risk of contamination of soils or groundwater	3	Diesel oil would leak into a bunded are which is a concrete structure and will retain any such leaks.	1	This is not a likelihood for the proposed development as there no requirement for additional oil to be stored on the proposed development site. Tanks provided within the gas fired power plant site will be bunded in accordance	3

Ref.	Process	Potential Risk of Major Accident	Phase	Impact	Consequence Rating	Basis of Consequence	Likelihood Rating	Basis of Likelihood	Risk Score
								with EPA Industrial Emissions Licence conditions.	
12	Low sulphur diesel oil storage tank	Catastrophic failure of storage tank	Operation	Rapid release of distillate oil. Possible overtopping of the bund and release into site drainage and potentially the environment. Possible contamination of soils or groundwater	4	Tank bunded to EPA requirements.	1	As above, this is not a likelihood for the proposed development. Tanks provided within the gas fired power plant site will be bunded in accordance with EPA requirements as set out in IEL conditions or otherwise as specified in the EPA's Guidance to Storage and Transfer of Materials for Storage and Transfer for Scheduled Activities (2004)	4
13	Low sulphur diesel oil storage tank	Tank fire or bund fire	Operation	Temporary offsite air quality impacts. Possible risk to onsite personnel due to smoke inhalation or exposure to thermal radiation. Possible contamination of soils or groundwater.	4	Though very unlikely a bund fire would be difficult to extinguish and could burn for a long time.	1	As above, this is not a likelihood for the proposed development. Low sulphur distillate oil has a high flash point and is not categorised as flammable. There will be no sources of ignition within the bund of the gas fired power plant site. In the remote event of the diesel being ignited a pool fire will result. The	4

Ref.	Process	Potential Risk of Major Accident	Phase	Impact	Consequence Rating	Basis of Consequence	Likelihood Rating	Basis of Likelihood	Risk Score
								worst-case pool fire in terms of consequence assumes the loss of the entire contents of the tank into the bunded area, noting that the bunded area exceeds 110% of the volume of the tank in line with IE Licence conditions..	
14	Low sulphur diesel oil storage tank to gas engines	Failure of pipework	Operation	Leakage of diesel and potential impact to soils or groundwater	3	Small bore pipework with isolation valves. Leak into system which has storage and petrol interceptors.	1	As above, this is not a likelihood for the proposed development. System would be used rarely given the gas fired power plant's operation on natural gas. System controls will ensure the probability of this occurring is very low.	3
15	Chemical storage room	Leakage of chemical from storage containers or pipework	Operation	Leakage may result in potential impact to soils or groundwater	3	Small chemical inventory stored on site	1	The proposed development will not involve the storage of chemicals on site. For the gas fired power plant, spill trays in chemical storage areas. Site drainage system will ensure no spillages can impact soils and groundwater.	3

Ref.	Process	Potential Risk of Major Accident	Phase	Impact	Consequence Rating	Basis of Consequence	Likelihood Rating	Basis of Likelihood	Risk Score
16	All buildings	Building Fire	Operation	Off site smoke	3	Short term air quality	1	Fire prevention policy and procedures applicable to both the proposed development and the gas fired power plant.	3

17.5 MITIGATION AND MONITORING MEASURES

The proposed substation and associated gas fired power plant will be designed and constructed in line with good industry practice, and, as such, mitigation against the risk of major accidents and/or disasters will be embedded through the design and in accordance with planning and Industrial Emissions Licence requirements. *Table 17-4* sets out the various mitigation and monitoring measures which will ensure this to be the case.

Table 17-4: Mitigation and Monitoring Measures

Reference	Potential Risks	Risk Score	Phase	Mitigation and Monitoring Measures	Outcome	Action
1	Extreme heat or cold weather	2	Construction / Operation / Decommissioning	The proposed development and the gas fired power plant will be constructed, operated and decommissioned in accordance with all relevant planning, building and environmental licencing codes.		Implementation of Planning Permission and IE Licence Conditions
2	Storm events	2	Construction / Operation / Decommissioning	As above		As above
3	Flooding	4	Construction / Operation / Decommissioning	None required.		None required
4	Pollution to soils / groundwater / surface waters	3	Construction / Operation / Decommissioning	Implementation of CEMP during Construction, EIAR and IE licence conditions during operations, and Decommissioning Management Plan during decommissioning	Potential for risk occurring is reduced significantly through the implementation of appropriate Mitigation Measures	Implementation of Planning Permission and IE Licence Conditions
5	Atmospheric emissions which exceed EPA Industrial Emissions Licenced parameters	4	Operation	This is relevant only to the associated gas fired power plant: Exhaust gases from the gas engines will be emitted to atmosphere through the exhaust stack. The stack will incorporate an in-situ proprietary Continuous Emission Monitoring System (CEMS). The selection, installation, calibration, ongoing quality assurance and annual surveillance testing of the CEMS will be undertaken in accordance with BAT.	As above	A Planned Preventative Maintenance Programme (PPMP) will be developed, in accordance with manufacturer's specifications, incorporating all abatement and control systems as well as plant, pipes, valves and flanges with a potential atmospheric emission source as deemed appropriate. All defects will be prioritised. Defects associated with health and safety and environmental equipment will be given highest priority and action will be taken immediately. Greener Ideas Limited will provide the results of the emissions monitoring to

Reference	Potential Risks	Risk Score	Phase	Mitigation and Monitoring Measures	Outcome	Action
						the EPA as directed in the Industrial Emissions License.
6	Leak of natural gas	4	Operation	This is relevant only to the associated gas fired power plant: The engine house will be fitted with pressure monitoring to detect a pressure drop and a gas detection system that will be interlocked with the plant control system	Potential for risk occurring is reduced significantly through the implementation of appropriate mitigation measures.	Planned Preventative Maintenance Programme (PPMP)
7	Leak of natural gas	4	Operation	As above	As above	As above
8	Leak from the lubricating oil cooling system	4	Operation	This is relevant only to the associated gas fired power plant: The entire lubricating oil system will be subject to regular inspection and maintenance to avoid leaks.	As above	As above
9	Fire in a transformer resulting in emissions of combustion products	4	Operation	All transformers are fitted with protection systems to protect against faults and prevent explosion.	As above	As above
10	Low sulphur diesel oil spillages during tanker unloading/delivery operations	6	Operation	Where refuelling is to take place on site it will be in an impermeable bunded area which will be subject to regular inspection and integrity testing in accordance with Industrial Emissions licensing requirements.	As above	As above
11	Leaks	3	Operation	This is relevant only to the associated gas fired power plant: In order to prevent escape of liquid fuel oil, in the unlikely event of a catastrophic failure of the tanks, a secondary containment system in the form of a tank bund will be provided. The bund will be	As above	As above

Reference	Potential Risks	Risk Score	Phase	Mitigation and Monitoring Measures	Outcome	Action
				fitted with pumping facilities to enable drainage of collected surface water. The storm water will pass through a silt trap and hydrocarbon interceptor prior to discharge. The bund will be fitted with ramps to allow access by the emergency services and maintenance personnel. All tanks, bunds and pipe networks will be designed and tested in accordance with BAT.		
12	Catastrophic failure of storage tank	4	Operation	As above	As above	As above
13	Tank fire or bund fire	4	Operation	This is relevant only to the associated gas fired power plant: In the improbable event of a major leak from the tank to the bund it is unlikely that this will lead to a fire as diesel has a flash point of greater than 55°C and is not classified as flammable. There will be no sources of ignition in the bund.	As above	As above
14	Failure of pipework	3	Operation	Pipes, bunds and storage facilities will be regularly checked for deterioration, damage and leaks. Integrity testing and the maintenance of all abatement, control and monitoring equipment will be incorporated into the onsite maintenance programmes.		
15	Leakage of chemical from storage containers or pipework	3	Operation	This is relevant only to the associated gas fired power plant: Conditioning chemicals will be stored relatively small quantities in a dedicated chemical storeroom within the water	As above	As above

Reference	Potential Risks	Risk Score	Phase	Mitigation and Monitoring Measures	Outcome	Action
				treatment plant which will be provided with appropriate ventilation and temperature control. Drums and IBCs will be stored on drip trays / spill pallets. The store will be enclosed and shall be capable of fully containing any spills within. A spill kit will also be located in close proximity to the chemical store. Only experienced and trained personnel will be permitted access to the chemical store on site. As required, conditioning chemicals will be transferred from the storeroom to the water treatment plant to replenish the dosing tanks. The transfer route will be kept clear of all obstacles to allow the safe transfer of chemicals. Dosing tanks will be fitted with level indicators and located within bunds. Transfer of chemicals will be undertaken by trained personnel only. The dosing tank level indicators and bunds will be subject to regular inspections. Cleaning products will be of a water based biodegradable nature wherever possible. Any hazardous cleaning products will be segregated in a locked cabinet with limited access to prevent misuse.		
16	Building Fire	3	Operation	Follow fire prevention policy procedures	As above	Fire prevention policy and procedures

17.6 CUMULATIVE EFFECTS

All of the risk scenarios identified in Tables 17.3 and 17.4 can be mitigated and monitored accordingly across the proposed development site and the associated power plant site. No cumulative impacts outside of the site with other existing development, projects or plans are predicted.

17.7 RESIDUAL EFFECTS

As can be seen in Table 17.5 below, the residual risk of a major accident or disaster occurring during either the construction, operation or decommissioning phased of the overall project is either very low or low. It should be noted in this table that all risk scenarios identified in Tables 17.3 and 17.4 are listed.

Table 17-5: Overview of Potential Risk

Likelihood	Very High	5					
	High	4					
	Medium	3					
	Low	2		3, 5, 9,			
	Very Low	1		1, 2	4, 11, 14, 15, 16	6, 7, 12, 13,	
			1	2	3	4	5
			Trivial	Minor	Moderate	Major	Massive
	Consequence						

18.0 INTERACTIONS OF THE FOREGOING

18.1 INTRODUCTION

The potential effects of the proposed Baldonnell 110kV substation and the measures proposed to mitigate these effects have been outlined in this EIAR. However, in any development with the potential for environmental effect there is also the potential for interaction between effects of the different environmental aspects.

The result of these interactions may either exacerbate the magnitude of the effect or may in fact ameliorate it. As part of the requirements of an EIAR, the interaction of the effects on the surrounding environment needs to be addressed.

Table 18-1 outlines the different environmental aspects which have potential to interact as a result of the proposed Baldonnell Substation. Interactions have been clearly identified in the early stages of the project and where the potential exists for interaction between environmental impacts, the EIAR specialists have taken the interactions into account when making their assessment. Potential interactions (both positive and negative) have been considered for the construction, operation and decommissioning phases of each of the different environmental aspects. It is noted that the operational life of the proposed development is expected to be at least 25 no. years and consideration has been made for the full duration of this time period with regards to an assessment of potential impacts and interactions.

Table 18-1: Interaction between Environmental Topic (positive and negative)

Interaction Matrix Corresponding Topic Heading Interaction No Interaction	Population and Human Health	Land, Soils and Geology	Hydrology and Hydrogeology	Air Quality and Climate	Noise and Vibration	Biodiversity	Cultural Heritage	Landscape / Townscape and Visual	Traffic and Transport	Material Assets	Major Accidents and Disasters
Population and Human Health											
Land, Soils and Geology											
Hydrology and Hydrogeology											
Air Quality and Climate											
Noise and Vibration											
Biodiversity											
Cultural Heritage											
Landscape / Townscape and Visual											
Traffic and Transportation											
Material Assets											
Major Accidents and Disasters											

18.2 DISCUSSION OF INTERACTIONS

In addition to Table 18-1, the following section summarises the primary interrelationships of aspects of the environment with the potential for significant effects as a result of the proposed 110kV substation.

18.2.1 Population and Human Health

Interactions with Land, Soils and Geology and Hydrology and Hydrogeology

During the construction phase of the development, there is potential for short-term interaction between Population and Human Health and Land, Soils and Geology and Hydrology and Hydrogeology.

This interaction is primarily associated with the disturbance of ground within the proposed substation site as a result of excavation works which may have potential for a negative effect on the Baldonnell Stream as a result of the erosion of soil and the inappropriate storage of excavated materials. There is also the potential for release of hydrocarbons, concrete and other pollutants which have the potential to result in pollution to soil, groundwater and surface waters. These potential impacts, along with detailed mitigation measures, are discussed in detailed in Chapter 8 and Chapter 9. With mitigation, these works will have no significant impacts on Population and Human Health.

During operation, the potential for interaction with Land, Soils and Geology and Hydrology and Hydrogeology is reduced. Any potential interactions are mitigated as set out in the respective chapters. A positive interaction is noted given that the operation of the substation will enable provide electricity to the neighbouring power plant, which in turn will regularise energy provision in the electricity grid especially in the context of an increase in use of renewable energy technologies, such as solar and wind power. This will accommodate and support Ireland's transition to a low-carbon economy and mean that Ireland can continue to invest in renewable sources of power in order to meet future national and EU targets.

The decommissioning phase of the proposed substation will result in generally similar impacts as the construction phase, albeit to a significantly smaller extent as much of the infrastructure will remain in-situ. There is an opportunity for positive impacts once decommissioned as these lands will be covered with earth and allowed to revegetate and reseed while the access roads will be used for the operation of commercial uses across neighbouring lands.

Interactions with Air Quality and Climate

During construction there is potential for air quality impacts from construction dust emissions as a result of excavation works, infilling and landscaping activities and storage of soil in stockpiles. This leads to the potential impacts on human health due to nuisance dust and the release of CO_2, N_2O, PM_{10} and $PM_{2.5}$ emissions. While construction dust tends to be deposited within 350 m of a construction site, the majority of the deposition occurs within the first 50 m (IAQM, 2014). The objective of dust control at the site is to ensure that no significant nuisance occurs due to low established sensitivity of the area. In order to develop a workable and transparent dust control strategy will be developed and incorporated into the CEMP as set out in Chapter 10 Air Quality and Climate.

The potential impact to air quality during the operational phase of the substation is long-term, neutral and imperceptible as there are no operational emissions from the proposed development.

The decommissioning phase of the proposed substation will result in generally similar impacts as the construction phase, albeit to a significantly smaller extent as much of the infrastructure will remain in-situ.

Interactions with Noise

Some 16 no. noise assessment locations have been identified that are representative of the nearest residential, commercial and amenity locations. The nearest occupied noise sensitive locations (NSL) are located some 400 m to the south of the approved gas fired peaking power plant (i.e., R001) and some 450 m to the north east (i.e., R014). The closest amenity to the development is Grangecastle Golf Course (i.e., R015) which is located to the east of the proposed plant.

Subject to good working practice as recommended in Chapter 11 Noise and Vibration, noise associated with the construction phase is not expected to exceed the recommended limit values and thus, it is not expected to cause any significant effects.

During the operational phase, in terms of the proposed substation element of the proposed development a computer-based prediction model has been prepared to quantify the potential noise level associated with the operational phase of this aspect of the substation on the receiving environment. Assuming the proposed substation installation has comparable noise emissions to the 110kV unit at Dunfirth (as discussed in Chapter 11) and considering the distance between the 110kV substation and the nearest off site locations (i.e., >220m) noise from this installation is not predicted to be an issue off site.

There will be no noise emissions from the operation of the proposed underground grid connection during its day to day operation. Consequently, there is no requirement to assess any noise emissions associated with this aspect of the proposed development.

The decommissioning phase of the proposed substation will result in generally similar impacts as the construction phase, albeit to a significantly smaller extent as much of the infrastructure will remain in-situ.

Interactions with Biodiversity

With the implementation of the CEMP during construction the proposed substation will not result in likely significant effects on any of the key ecological receptors at any geographic scale, with the exception of permanent loss of wet grassland and bare ground habitat within the proposed development site.

Interactions with Cultural Heritage

All topsoil/overburden stripping has already taken place on site and will be monitored by a suitably qualified archaeologist. If any features of archaeological potential are discovered during the course of the works further archaeological mitigation may be required, such as preservation in-situ or by record. Any further mitigation will require approval from the National Monuments Service of the Department of Housing, Local Government and Heritage (DoHLGH).

There are no potential impacts on the cultural heritage resource as a result of the proposed development, as such mitigation measures are not required at operational phase.

Interactions with Landscape / Townscape & Visual Impacts

The landscape / townscape sensitivity of Profile Park is considered Medium-Low. As such at construction stage the impacts on landscape/townscape will be short term as the site is already modified and there already exists frequent vehicular movement. The construction works will inherently by screened and will cause only minor impacts on the character of the Grange Castle Golf Club.

At operational stage, due to existing and / or imminent screening by the permitted Profile Park Power Plant and its associated landscape mitigation planting, the proposed substation is only visible from VP2 and VP4 where it is seen as a modest ancillary development against the backdrop of the Power Plant. The visual impact significance at both of these viewpoints is deemed to be 'Slight-imperceptible' and of a 'Neutral-Negative' quality. At all of the other viewpoints, the significance of visual impact is deemed 'Imperceptible'.

Decommissioning stage impacts arising are likely to be similar to the construction stage impacts and of a shorter duration with an overall neutral and temporary impact within its context.

Overall, the proposed substation will not result in any townscape or visual impacts.

Interactions with Traffic and Transport

Public perception of the construction phase will be influenced primarily from the impact of traffic movement. When taken in context with the existing traffic flows in the area, the operational traffic from the proposed substation is expected to result in 5 vehicle movements per day and therefore potential impacts are considered negligible. Any increase will be short-term in nature (expected duration of construction phase is approximately 18 months) and once the substation is operational, traffic movements to and from the site will be negligible.

Interactions with Materials Assets

There are material assets along the proposed routes associated with the electrical grid and gas connection. However, these assets which relate to public utilities primarily are development in built up 'made' land. Short term impacts may will arise due to the requirement for access to third party properties to facilitate construction. Aviation impacts on Casement Aerodrome have also been assessed and not considered to be significant in relation to impacts on military operations. There will not be a significant interaction therefore between Population and Human Health with Material Assets during the construction, operational or decommissioning phases of development.

18.2.2 Land, Soils and Geology

Interaction with Hydrology and Hydrogeology; and Biodiversity

During construction, this interaction is primarily associated with the disturbance of ground within the proposed substation site as a result of excavation works which may have potential for a negative effect on the Baldonnel Stream as a result of the erosion of soil and the inappropriate storage of excavated materials. There is also the potential for release of hydrocarbons, concrete and other pollutants which have the potential to result in pollution to soil, groundwater and surface waters.

During operation no new impacts will arise. Some construction traffic may be necessary for maintenance of the site (power plant and tank farms) which could result in minor accidental leaks or spills of fuels/ oils affecting the groundwater and potential surface waters also.

The decommissioning phase of the proposed substation will result in generally similar impacts as the construction phase, albeit to a significantly smaller extent as much of the infrastructure will remain in-situ.

Mitigation measures/standard design measures and management controls as set out in Chapter 8 Land, Soils and Geology will negate any potential impacts.

Interaction with Cultural Heritage

Although archaeological test trenching at Profile Park and neighbouring Ballybane substation discovered a series of historic remains, ground disturbances during construction associated with the proposed substation site may have a direct negative impact on archaeological remains that may survive within the site. In order to mitigate this, all topsoil/overburden stripping associated with the proposed substation will be monitored by a suitably qualified archaeologist. If any features of archaeological potential are discovered during the course of the works further archaeological mitigation may be required, such as preservation in-situ or by record. Any further mitigation will require approval from the National Monuments Service of the Department of Housing, Local Government and Heritage (DoHLGH). No significant operational or decommissioning phase interactions are predicted.

Interaction with Traffic and Transportation

During the construction phase, topsoil and subsoil removal will be required to a 'competent founding layer' and will be willed with structural and/or concrete to the appropriate finished floor level. Additionally, grid connection will be laid beneath the ground surface and/or private road. As such, a verification condition survey will be carried out over the full extent of the route and the excavated material will be cast to the side to be used as backfilling material and will be smoothed with the back of an excavator bucket to minimise runoff.

At all stages there is a risk of contamination of soils due to potential spills or leaks from infrastructure and equipment on site. However, the operational team on site will follow appropriate mitigations measures such as minimal refuelling or maintenance of operational vehicles and use of impermeable bunded areas where leaks are prone to occur which will help minimise any potential negative effects on soils.

When taken in context with the existing traffic flows in the area, this traffic will be short-term in nature with no significant impact predicted. No significant operational or decommissioning phase interactions are predicted.

Interaction with Material Assets

During construction, potential impacts mainly occur with existing neighbouring properties, road network, public utilities, aviation, and raw materials.

Potential impacts to third party properties will be in relation to requiring access to allow for construction works and any further impacts will be minimised.

In terms of impacts on utilities, hey laying of electrical, gas, water, wastewater and telecommunications pipelines and cabling may lead to 'slight negative temporary impacts' as

there could be potential damage caused to unidentified utilities. As such it is proposed that utilities will be further identified and mapped at the detailed design stage.

The neighbouring Casement Aerodrome located approximately 1km to the south may be impacted due to the use of cranes during construction activities. In order to avoid any potential issues, the Department of Defence will be consulted 30 days prior to use of equipment on site. However, it is unlikely that any cranes used during construction will reach the aerodrome's Inner Horizontal Surface.

There is potential for 'imperceptible, negative and permanent impacts' due to the sourcing of some raw materials from outside Ireland as some of the equipment parts may not be manufactured in Ireland which will in turn result in the use of some non-renewable materials. However, it is proposed that much consideration will be given to the selection and sourcing of materials to promote sustainability and reuse of materials. No potential impacts are perceived on the local rail and canal network, recreational facilities, pedestrian ways, land resources, geological sources, and natural amenities.

During the operational phase, the main impacts arising from the development proposal are long term positive effects on the public utilities as the proposed substation will facilitate the powering of the neighbouring powerplant and support renewable energy integration to the grid network while also providing power to data centres.

18.2.3 Hydrology and Hydrogeology

Interaction with Biodiversity

At a local scale, the Baldonnell Stream flows through the site from in a north-south direction. The Baldonnell stream continues to flow northwards, discharging into the Griffeen River which then discharges into the River Liffey at Lucan. Minor surface water ponding occurs on the site. The proposed development is not located within a catchment which has identified ecological habitats such as NHAs, SACs and SPAs.

In order to mitigate potential effects during the construction phase, best practice construction methods will be implemented in order to prevent water (surface and groundwater) pollution. A drainage system has been designed for the site including a number of features such as check interceptor drains, and swales during the construction phase, and surface water pumps, petrol interceptors, and down pipes/gullies during the operational phase. These are designed to maintain discharge rates at existing levels and remove any sedimentation arising from excavation works.

A Construction and Environmental Management Plan (CEMP) was developed for the project to ensure adequate protection of the water environment. All personnel working on the project will be responsible for the environmental control of their work and will perform their duties in accordance with the requirements and procedures of the CEMP. Operational maintenance works include regular scheduled maintenance works, regular inspections of all project elements with any unscheduled repairs or maintenance arising to be undertaken.

Interaction with Major Accidents and Disasters

Baldonnell Stream is located within the site boundary. There are no streams in close proximity to the substation location. There is, therefore, no risk of significant impact on the surface water from substation fire.

It is noted that the risk of major accidents associated with this development and hydrological/hydrogeological factors is very low and would not cause unusual, significant or adverse effects on the hydrological or hydrogeological environment during the construction, operational and decommissioning phases.

18.2.4 Noise and Vibration

Interaction with Biodiversity

Construction related noise and the physical presence of machinery and construction personnel could result in the disturbance of breeding birds from habitats located in close proximity to the proposed substation. However, since the proposed construction works is considered small scale and short term in nature, it is likely that the birds will acclimatise to human presence over time. In the event that any nests are identified the appointed ECoW will provide recommendations as to whether a license is required for vegetation removal and will detail the process for obtaining such derogation from the NPWS.

During the operational phase, disturbance during the operational phase will be limited and will not result in significant noise or vibration impacts on the receiving environment as it will be operated remotely with occasional site and maintenance visits due to minimal increase in vehicular movements.

The decommissioning phase of the proposed substation will result in generally similar impacts as the construction phase, albeit to a significantly smaller extent as much of the infrastructure will remain in-situ. No vibration interfaces are predicted at any stage of the project.

18.2.5 Major Accidents

Interaction with Multiple Topics

In respect of adverse climatic events, it should be noted that the proposed substation will be constructed, operated and decommissioned in accordance with all relevant planning, building and environmental licencing codes. The substation is not considered to be at risk during storms or during extreme heat or cold event, any more so than other significant buildings or structures. The potential significant environmental effects relating to major accidents are set out in detail in Chapter 17 Major Accidents and Disasters. Substantial mitigation and monitoring measures are proposed to ensure the potential for these effects to occurs is not realised. No significant impacts are predicted during the construction, operation or decommissioning phases of the proposed substation.

18.3 CONCLUSION

All environmental factors are interrelated to some extent. However, the most common interactions are between Population and Human Health and visual perception, noise, air quality and biodiversity. Having studied the interaction of potential impacts during the construction, operational and decommissioning phases it has been determined that no amplification effect is anticipated. The proposed substation will have some positive impacts on an international, national, regional and local level, particularly in terms of helping to achieve renewable energy targets. It is important to note that many of the physical, environmental and landscape and visual impacts are reversible upon decommissioning of the substation.